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EDITORIAL.

AMENDING THE PURE FOOD AND DRUGS ACT.

The Supreme Court decision in the Johnson case is not to serve as a license for all sorts of quack jobbery, or to furnish the music by which unscrupulous nostrum vendors are to keep their fiddles going for the dance of death. Whatever hopes the charlatans may have had in this direction are doomed to disappointment, as, indeed, every thinking person anticipated. The President's recommendation for an amendment to the Pure Food and Drugs Act was a logical sequence to the action of the Supreme Court in the case in question; and this refers both to assenting and dissenting opinions, between which there was not really the fundamental difference that many supposed. Both amounted, in effect, to a declaration that the domain of therapeutic virtue in a drug or a remedy offered two separate spheres of evaluation: one involving a mere opinion, the other a question of fact; the former unamenable to legislation, the latter well within the scope of law. The difference between Mr. Justice Holmes, for the majority, and Mr. Justice Hughes, for the minority, lay in their respective conclusions as to the side of the line upon which the case at bar fell, and as to the power of the present law properly to divide the two spheres.

In his opening sentence Mr. Justice Holmes made it clear, in a general way, that the Johnson case embodied a fraud, but not such as could be hit by the present law; and in his closing paragraph he pointed out in what respect such a fraud might possibly be imported within the meaning of the Act. It is really the same principle which runs through Mr. Justice Hughes' more elaborate dissenting opinion, which, however, he holds to be covered by the present law. But, whatever our individual view of the two arguments, the majority opinion must perforce be accepted

as the authentic interpretation of the law; and all that now remains to do is to amend the law so as to embody the principle thus enunciated by both majority and minority. The decision practically amounts to a challenge to do so.

It was not likely that such a challenge would go unheeded by Congress, even if the President had not lent his official influence; and a motion to amend had already been made in the House prior to the President's action, but his recommendation will give it the character of an administration measure, and do much toward promoting its passage.

The formulation and enactment of an amendment to meet the situation will not be easy. In view of the Supreme Court ruling in the *School of Magnetic Healing* case, it would appear to be a task of some nicety to import into the law a regulation of therapeutic claims which will stand the test of judicial interpretation. And it might as well be frankly admitted that certain dangers do lurk in a legislative attempt to arbitrate therapeutic standards. But most of the exploited dangers are those which threaten the quack manufacturer's pocket-book; and the outcry is for the most part the cry of "wolf" raised by the wolves themselves.

The bog of "unconstitutionality," which doubtless disturbs many law-abiding citizens, need scare nobody. The constitution distinctly invests Congress with absolute control of interstate commerce, even to the implied recognition of a "system of medicine" if it should choose to do so. But of course it will not; and the agitation on this score is wholly gratuitous. The fact is, nothing mandatory is contemplated in this phase of the Act at all. It is a negative restriction, and can be nothing else. It is the principle of all reputable schools of medicine, and of medical science in general, that they guarantee no cures; hence such a negative prohibition as that which the law proposes to apply to medicines, so far from being repugnant to medical freedom, is wholly consistent with it. There is, in short, in such a law, no question of establishing a system of medicine, but, on the contrary, of preventing false claims to any infallible system of cure.

Nevertheless, the problem is a knotty one. Without doubt the curbing of false and impossible claims for nostrums and quack medicines is a consummation devoutly to be wished. But, without doubt also, to attain this end through the agency of law—especially of interstate law—is by no means the simple, straightforward matter that some of our enthusiastic friends seem to think, or that even the presidential message would suggest. The mere addition of a misbranding clause to include false statements of therapeutic effects will not avail much, for sheer therapeutic claims are, and must always remain, pure matters of opinion, and a hundred statutes cannot make mere opinion the gauge of a crime.

To be sure, Congress might appoint a board of censorship to pass upon all medicinal products before they become eligible for interstate shipment; but, even if its constitutional power to do this be conceded, we hardly think it would take so extreme and questionable a step.

So far as we can see, two courses are open to Congress by which the Act may be strengthened and broadened in the direction contemplated. It may amend the language of the misbranding clause so as specifically to cover false statements of the pharmacological and physiological effect of remedies; and it can include in its provisions a blanket prohibition of false therapeutic claims so far as they relate to facts, leaving it to the courts, in individual cases, to determine this factual relation. The first of these amendments would at once import within the meaning of the Act all that class of cases, referred to by Mr. Justice Holmes in the closing part of his opinion, where a commendation of the remedy would, to all common understanding, amount to an implied statement of the contents of the package. The second would open the statute to at least a consideration by the courts of therapeutic claims, from which they are at present entirely shut out by the Supreme Court decision. And, even though a future ruling should invalidate the new provision, yet its restraining influence would in the meantime be salutary, and its outworking would doubtless lead to some practical solution of the problem, so that in time an adequate relief might be found.

When all is said and done, however, the purgation of the label does no more than touch the fringe of this particular question. So far as fraudulent therapeutic claims are concerned, the real menace to the public interest lies, not in the label, but in the advertising done by the nostrum makers and quacks. If, and to whatever extent, the Pure Food and Drugs Act can be made to apply to false and misleading therapeutic claims on the label, it ought to be appreciable to the advertising matter, both that which accompanies the packages and that which is transmitted through the mails, including newspaper advertisements where these circulate between States. Interstate newspaper advertising must, of course, be taken care of by State law.

This, also, we recognize to be a rather difficult and touchy matter to handle, and one which has its inherent limitations. Here and there, sporadic attempts have been made in this direction by State legislatures, which have come to grief at the hands of the courts, largely, we think, because they have been too extreme, and have sought to make the newspapers themselves responsible, which is a good deal like making the railroads responsible for the misbranding of the packages they carry. But, as stated, to whatever extent the labels are subject to regulation by law, it would seem that the advertising matter should be equally amenable to

similar regulation; and if anything worth while is to be accomplished in the way of public protection, it will have to be. To restrict the label and not the advertising is like holding a man to account for a libelous utterance by mouth while permitting him to circulate a slander by mail or newspaper with impunity. Now that the question is up, it would, it seems to us, be an opportune time to make a clean sweep of the whole field.

THE SIXTY-SECOND ANNUAL SESSION OF THE AMERICAN MEDICAL ASSOCIATION.

The presidential address at the meeting of any corporate body of medical men is always of moment; but in the case of the American Medical Association it is fraught with the greatest importance to the community, since it represents the attitude of this splendid organization to the medical and lay interests which are uppermost in the minds of all thinking men. In his address before the sixty-second Annual Session, at Los Angeles, in June, Dr. John B. Murphy, the President, did not slur over the needs of the hour in a way that would be declarative of the sort of optimism that views all things through rose-colored glasses. Not that we would convey the idea that Dr. Murphy's tone was not hopeful; but, by making certain pointed statements unweakened by the circumlocutory methods usually pursued in annual addresses, he brought home to all, who have watched the evolutionary stages of medicine in this country, certain truths which should not be forgotten.

Of all the salient features of Dr. Murphy's address, his remarks on the advisability of clinics during the session of the Association are most opportune. Is it not a fact that the profit which accrues to the average medical man, attending a session of the American Medical Association, is sadly hampered because of the multiplicity of papers which are read and the lack of the only leaven which could activate his languishing interest—namely, clinics?

That this innovation at the sessions would be their greatest asset cannot be denied by anyone who has possessed his soul in patience, despite the onslaughts dealt by droning voices pouring forth apparently endless disquisitions, and who may have had a glimmering that, by being taken to the bedside of a patient, a restoration of drooping spirits and a furtherance of knowledge could be effected. And now that the word has gone forth that clinical teaching should be added to the programme so that the sessions shall have the *cachet* of being educational, it would seem to us that the House of Delegates should not think too lightly of this matter.

Another important point in Dr. Murphy's address was what he said

about the present status of the physician. At those times when our superficiality in regard to this vital matter asserts itself, we are ready to declare that at no time in the history of medicine has the physician been so prosperous; though when we take the trouble to look into the matter with greater scrutiny and divest ourselves of what we think should be, the thought must occur, that granted the elect are greater accumulators of money than were their congeners in the past, the rank and file are not so well off. This state of affairs would not be so deplorable if the average man would be content to lumber on in a state of content on a stipend that does not grant him the wherewithal to meet his growing expenses; but things being otherwise, we see, as Dr. Murphy emphasizes, that he is forced to deteriorate into a quack, an advertiser, a commission man, a fee divider, etc. Of course, we do not mean that every average man in the profession loses his self-respect to the same degree; but, since he must live decently, the temptation which comes his way by the many avenues which are tributary to the practice of medicine is certainly an ever-present lure when the increased cost of living has to be met.

As regards medical education, Dr. Murphy made some pertinent statements which show that he has thought deeply on the subject. His plea that it does not follow that, just because a departmental head is an original investigator and a laboratory expert, he is necessarily a good teacher, one who has the art of pedagogy at his fingers' ends, is excellent enough to give us pause for some time; for the tendency to-day is to be firmly convinced that the "scientific researcher" is so far superior to the man who was "chosen for the chair" some thirty years ago—"chosen" because he was prominent on account of a large and lucrative practice—that to deny him any of the virtues of a teacher would be sacrilegious. But to tell the truth the art of pedagogy—and who can deny that it is an art?—is not always allied to original investigation; hence, as Dr. Murphy says, would it not be better for "the president and the faculty of a university to elect as teaching head of departments men capable of imparting information with force and in such a way as to be grasped, appreciated and retained by the student body"?

All those physicians who are interested in the newer note in medicine should read this presidential address in an intelligent and receptive mood, since it comments upon the problems which are with us at present. It is well in its way to say that these are matters so difficult of solution that only in years to come may a hope be entertained of a desired fulfilment. Now though it may be right to contend in this manner if conservatism is the fetish to be respected, it is wholly wrong if a change can be effected by radical methods that take small note of time, but have the high virtue of righting what is wrong in any community or organization, be it medical or lay.

OPINION AND CRITICISM.

THE OPEN AIR.

Although it is a fact that the circumambient air has always been at our beck and call to do with it as our sanity should dictate, it has been only in the last few years that it has really occurred to the thinking part of the medical profession to utilize it as a means to an end—the alleviation of those mental and physical disabilities which have withstood the kindly and even harsh intervention of medicines in a way that was baffling, to say the least. How the thought arose, that the respirable fluid of vampiric qualities, which had been excluded from our homes as one would shut out the pest, was not after all an enemy of man, but a beneficent ministrant at all times, is not within the knowledge of the present writer; but let us hope its evolvment into an unassailable fact was slow, since it is a matter of history that when facts are not too suddenly evolved from chaos their chances of longevity are better. Now though we may be vague when it is a question of historical exactness, what can be asserted with assurance is that to-day the appreciation of the curative qualities of air is high enough to warrant the statement that many Almroth Wrights will have to be forthcoming before there is any vitiation of our enthusiasm.

It would be a twice-told tale to hark back to those primitive times,—not so far distant, by the way, as pointed out by Bernard Shaw in his play “The Doctor’s Dilemma”,—when consumptives were immured in tight-closed rooms lest a breath of fresh air should not only bring on a harassing cough, but cause a fresh cold to be produced. All that is ancient history, or rather shoved back into remoteness by our shamefaced confession of one of our many ignorances. But just because we have rectified this mistake, should we sit with folded hands, happy in the thought that our work is complete? This is not the opinion of those medical investigators who are at present stirring the waters of our customary apathy. According to them, much can be accomplished by the intervention of open air, and if the reader is at all in doubt we would refer him to Dr. S. Pozzi’s exceptionally well-written article “Les Fous En Liberté (Open-Door)” in the French publication, *Aesculape* for April, the Berlin letter by Professor Bickel in *Folia Therapeutica* for April, “The Open-Air Treatment of Acute Infectious Diseases” in *Public Health* for May, a method pursued with gratifying success at the Nottingham (Eng.) City Isolation Hospital, and the numerous articles in the German lay and medical journals on the “Nature Theatres” of Germany for the cure of nervous diseases.

Thus is made apparent even to him who is not too readily convinced, that the open air is arriving at the distinction of being an undeniable asset in the armamentarium of the modern physician, which for unexplainable reasons never deigned to accept it before now. No doubt there will always be those amongst us who will laud the efficacy of drugs to the exclusion of "natural" medication, but even so, the propaganda for more and more open air in the treatment of certain diseases will not suffer, since it already stands foursquare, and moreover has behind it the sanity which must win in the end.

ON MEDICAL INSTITUTIONS.

In a story recently published in one of the weekly literary papers, the mother of an injured child protests against sending the child to the hospital for fear of his being "cut up," and is only persuaded as to the wisdom of the course by the strenuous attitude of the hero, a base-ball player. It is not often that a member of a professional base-ball team is called upon for this function, but it is often enough the fate of sick persons to be kept from institutions when it is necessary for them to be there. Fortunately the antagonism to hospitals on the part of patients is being rapidly dissipated by experience of patients in the modern houses of rest. Likewise the art of knowing when to send the patient to the hospital is being better developed by the physician. Whereas formerly only extreme surgical cases were considered sufficiently ill to demand hospital treatment, now obstetrics is being done wholesale in institutions, and it is recognized that severe medical cases will also be benefited by a stay in a good hospital. The value of good nursing and proper regulation of the environment, often impossible in the private home, is receiving its just recognition, and the demand for increased medical services in all large general hospitals is the best indication of the increased supply. In the cities this supply is recruited from patients both of the "private room" and of the "ward" classes. It is not difficult to find the reason for this. Among the private patients the luxury of the hospital is almost a necessity for their wellbeing, whereas with the free patients the close association of dispensary, hospital and social service corps makes it easy to impress the patients with the advantages of the hospital as compared to the situation at home.

So far we have only mentioned treatment, but by far the most important rôle of the hospital in its relation to the patient and the physician is that of assistant diagnostician. The modern institution has all the necessary aids for diagnosis—clinical as well as laboratory—that are possible in the equipment of most physicians in private practice, and on that basis has the logical right to all "doubtful" cases. In the institutions for special cases, the better detailed treatment will rest upon a larger

experience in diagnosis,—special sanatoriums for the treatment of certain diseases, therefore, have a clear call for support.

We do not by any means wish to give the impression that the present system is ideal. Though we believe that the tendency of the times is good, there are many errors which will be corrected as progress advances. The idea of sending every patient to an institution is, we are sorry to believe, too often due to self-interest on the part of the physician, and not to a desire to improve the patient or to advance medical knowledge. Further, the hesitancy to use private patients for clinical purposes is not good. It can do no harm, and generally speaking the more a "case" is studied, the better results are attained in the therapy of the "case." And as a final word we register a protest against the plan of many institutions, which gives the rich or the poor the very best of medical attention, but pays scant regard to those whose means are too modest for a private room and yet too large for the public ward. This error is, however, a fundamental one in medical practice, and applies as well outside as inside an institution. Perhaps were physicians compelled to pay for medical advice, the truth of the last remark would be intensified by the force of sad personal experience.

LITERARY NOTES.

That tantalizing question, What is the origin of life? has been made the subject for an elaborate study in Dr. H. Charlton Bastian's "Origin of Life" just published by Watts and Company of London. To appreciate the author's contention, the reader must first strip himself of all those mystic interventions, in the matter of evolution, with which from youth upwards he has, so to speak, cluttered his mind; and then close the door tightly lest they rush in unawares. Granted that this can be done, Dr. Bastian's explanation is easily understood, and for simplicity deserves high commendation. As the author says: "If a genesis of living matter occurred in some one place in far-remote ages, and if such a process can be shown still to occur, it would be only natural to conclude that the same chemico-physical processes have, in all probability, been operative in innumerable regions over the surface of the earth, not only in primeval but in all succeeding ages up to the present day. I have long held such a belief * * * this belief has, during the last four years, been notably strengthened by the results of experiments, many times repeated, made with inorganic materials, and now to be further referred to." To illustrate how readily this may be done, the author writes: "All that will be needed are some tubes of soft soda glass, similar to those that I have employed, a strong can containing a quart of colza oil, a good thermometer, some distilled water, and three or four simple chemicals (sodium silicate, ammonium phosphate, dilute phosphoric acid, and liquor ferri

pernitratris). No incubator is necessary. The sealed and superheated tubes may be left at rest inside a closed south window for one, two, three or more months before opening them and most carefully examining their contents. The last point is all-important, for without the exercise of much care it will be easy enough for an unbeliever or even a hasty observer to fail to discover any organisms." So here one has the whole perplexing problem in tabloid form, and if materialism reigns supreme in the reader's mind what can be easier than either to make the experiment or accept the author's word, not only as regards the experiment, but as an indisputable proof that life began in a similar lowly fashion, though all the metaphysicians through the ages may contend that the intellect can work its way back to remote times, but must call a halt when the origin of life has to be defined. This is graphically shown in M. Henri Bergson's "Evolution Créatrice," a translation of which has recently been published by Macmillan and Company, and in which the metaphysical view of evolution is set forth to the complete satisfaction of all those readers, whose attitude to this vastly interesting subject is the sort that is in sympathy with the science of metaphysics. But all students are not of this ilk; hence Dr. Bastian's exposé is not without its value. If the writer of these lines may be permitted to give advice he would say, read both books most carefully, for by doing so the thought may arise in the reader's mind that though materialism, as illustrated by the chemical retort, and metaphysics are antipodal when brought to bear on how life really began, it is nevertheless far better to know both sides of the question than to exclude one or the other.

The *Strassburger Post* of recent date contains an interesting article on comparative thirst in European Countries. The Dane, for instance, annually consumes 104 litres of beer, almost no wine, and 24 litres of cognac. The Swede quenches his thirst with 56 litres of beer and 9 of alcohol; while the Norwegian, on account of the stringent laws obtaining against the sale of liquor, compels himself to exist on 31 litres of beer and 3 of cognac. In Russia the amount of beer and vodka that is drunk per head is small,—5 litres of each; but in France the quantity runs considerably higher,—32 litres of beer, 10 of cognac, and 108 of liqueur. The Englishman shows a liking for 6 litres of whisky or gin, 2 litres of claret; but he shines especially when the quantity of ale or stout is considered, for according to statistics he annually consumes 152 litres! The Hollander contents himself with 38 litres of beer and 8 litres of cognac; although for his neighbor, the Belgian, 221 litres of beer and 9 of alcohol are necessary. The Austrian and the Hungarian take the same pace as regards schnaps (11 litres), wine (16 litres); but, when it is a question of beer, the Austrian true to his German proclivities outstrips the Hungarian by drinking 80 litres to the latter's 11. Of all the inhabitants of Europe the

distinction of drinking the smallest amount of beer and alcohol belongs to the Italian, who drinks 2 litres of the former and one of the latter, but owing to the cheapness of wine we find that he consumes 98 litres of this beverage annually. As regards the German Empire, if we take it in its entirety, including Luxemburg, the statistics for that very thirsty country are 125 litres of beer, 7 of wine, and $6\frac{1}{2}$ of alcohol per each individual; but if we examine each state separately, we see that the inhabitant in the North of Germany and the Alsacian drink 98 litres of beer, while the inhabitant of Baden consumes 158, the Wurtemburger 169, the Bavarian 240. By comparing the great beer drinking centres, the amount assumes astonishing figures, for the Berliner has 200 litres to his credit, the Nuremberger 325, the Frankforter 432 and the citizen of Munich 570.

It would be a dereliction on the part of any editor, who has the interests of medical journalism at heart, not to notice the June issue of the *Edinburgh Medical Journal*. In this Centenary Number there are a number of excellently-written articles on Sir James Y. Simpson, the most personal being the one written by his daughter, which tells in a most charming manner those traits in one's character without which any pen-portrait is incomplete. Although the medical world of to-day is not forgetful of what this pioneer in the administration of chloroform did to alleviate suffering, the emphasis placed upon his endeavors by the publication of this Centenary Number should not be considered a matter of supererogation, for by bringing together a number of essays, descriptive of Simpson's activities, a larger view is given us and many reminders to show that we really did not know as much of his life as we should. Of course, as all of us know, the celebration of the centenaries of great men has been somewhat overdone of late; but in this instance there is nothing to cavil at, since out of Simpson's perseverance and industry, in the matter of finding an anesthetic other than ether, a discovery was given to the world which marks one of the great epochs in medicine. Of the triumvirate of discoverers of anesthesia, Morton and Simpson are not without honor in their respective countries; but as regards Wells, his name is well-nigh forgotten in his native land, though Paris is at present making an attempt to collect funds toward the erection of a statue so that some honor may be shown a genius, whose neglect by the medical world, especially by the American contingent, is a blot on our civilization.

ORIGINAL ARTICLES.

THE CLINICAL SIGNIFICANCE OF CERTAIN FORMS OF ALBUMINURIA.

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The purpose of this paper is to discuss certain forms of albuminuria, which are by no means rare in practical clinical experience and which, generally speaking, are not sufficiently appreciated by the profession. The following forms come under consideration:—

1. Simple continuous albuminuria.
2. Orthostatic (vasomotor) albuminuria.
3. Residual (post-nephritic) albuminuria.
4. Chronic non-progressive nephritic albuminuria.
5. Hypertensive albuminuria.

1. *Simple Continuous Albuminuria; Illustrative Case.*—A few months ago a young married man, aged twenty-nine years, was referred to me for advice with regard to the presence of albumin in his urine. He first became aware of its existence one year previous, when he was rejected at life insurance examination because of Bright's disease. During the intervening year his urine had been repeatedly examined and always with the result of finding albumin present. His habits were abstemious and he denied having had any illness since early childhood. He declared himself in good health and had experienced no symptoms. On physical examination his heart was found to be normal in size and the heart tones clear. Pulse 72, blood-pressure 120 mm. There was a second degree floating right kidney. The twenty-four-hour collection of urine amounted to 1,200 c.c., had a specific gravity of 1,022, and contained 2 per cent. albumin (centrifuge). Routine observation of the urine has been conducted, many specimens being analysed with the result of finding albumin present in each specimen. In addition to serum-albumin almost every specimen tested gave the acetic acid (euglobulin) reaction. The amount of albumin varied within a considerable range, apparently under the influence of bodily activity. No casts have ever been found in the urine sediment. Maximum albuminuria 5 per cent. bulk.

The foregoing is a good example of a type of albuminuria that is by no means rare. It is impossible to determine in the case cited, how long the albuminuria has existed and what was its genesis in the first instance. Although only eighteen months since the condition was accidentally discovered, it is probable that its origin dates well back toward childhood. This presumption seems a fair one when we consider the frequency of harmless albuminurias in childhood and early adolescence, especially in males. Tiemann (*New York Med. Journ.*, March 17th, 1894) found the frequency of albuminuria in children and adolescents from ten to twenty years of age to be 22 per cent. as against 9 per cent. above the age of twenty-one years. Albuminuria of the vasomotor type, beginning in early life, may persist beyond the pubertal period into adult life, requiring at times many years for its complete disappearance. The so-called vasomotor (orthostatic) albuminuria of childhood and early adolescence is usually marked by the presence in the urine of the acetic acid reaction (euglobulin), and the fact that the case cited gave this reaction would throw weight in favor of interpreting the condition as a hold-over from such an albuminuria arising in early life. The absence of casts and the normal cardiovascular system furnish proof of its harmless character. I dismiss the fact of the right floating kidney as unimportant in the etiology of my case. It is not sufficient explanation for the continuous nature and severity of the albuminuria. It is undoubtedly true that a floating kidney, especially when the degree of displacement is great, may give rise to albumin and albumin and casts in the urine. That such cases may be mistaken for nephritis, we have amusing proof in the statistics of Edebohls in his book on the "Surgical Treatment of Bright's Disease." The albuminuria of floating kidney is usually of slight grade, is intermittent in character and is rarely observed in the male, although it is among males that the so-called harmless albuminurias are most frequent.

Simple persistent albuminuria is a condition which may exist for years without apparent detriment to the individual. One may follow such cases for long periods, as I have in a few instances, notably in two young physicians, without any other indication of kidney disease making its appearance. We are very apt, and quite rightly, to attach importance to albuminuria when it exists in early adult life. The fact that it may occur and continue for long periods as an innocent manifestation should be more fully appreciated. The essential features of this type of albuminuria are its continuous character, its independence of changes in position, and the absence of the other urinary signs and of the organic secondaries that characterize nephritis. Hyaline casts are not unknown in these cases, but unsupported by other evidence of nephritis they need be given little weight in diagnosis. Considerable care is necessary to identify cases of simple albuminuria. An opinion is to be expressed only after repeated examination and after determining the absence of

cardiovascular and retinal secondaries. Most of these cases are treated as obscure nephritis. This is an injustice to these individuals as much harm is done them; for by rigid diet and restriction of their activities they may become converted into invalids, whereas what is needed is normal activities, a full nourishing diet, and general tonic measures.

2. *Orthostatic (vasomotor) Albuminuria; Illustrative Case.*—In February, 1905, a slim but well-developed lad, aged twelve years, was brought to me on account of albumin in his urine, which had been accidentally discovered in the course of a routine examination by the family physician. The family history was excellent and the patient's personal history devoid of more important illnesses than measles, whooping-cough, and two mild attacks of tonsillitis. The only symptoms recently complained of were occasional headaches and one attack of acute indigestion induced by overindulgence in candy. The boy was of a decidedly nervous temperament and displayed a degree of vasomotor instability indicated by flushed cheeks, dermographia, moist, clammy hands, and low tension compressible pulse. Physical examination of lungs and abdomen was negative. The heart boundaries were normal and the heart tones clear. Blood-pressure was 110 mm. in the recumbent position and 100 mm. sitting, the reverse of normal. Blood examination showed a slight anemia. The day's urine amounted to 1,000 c.c. and contained one per cent. by centrifuge of serum-albumin and a distinct acetic acid reaction. Each urination during the day was separately tested for albumin with the following results: No. 1, passed before rising in the morning, contained no albumin; No. 2, passed after breakfast at 9 a. m., patient meanwhile not having stood, was also free from albumin; No. 3, voided at 11 a. m., patient walking about, containing 2 per cent. bulk of albumin; No. 4, voided at 2 p. m., after a brisk walk and the usual midday activities, contained 20 per cent. bulk of albumin; No. 5, at 5 p. m. showed 3 per cent.; and No. 6 at 8 p. m. also 3 per cent. albumin. It was only after searching five slides of the sediment from the albuminous urines that casts could be found, and these were purely hyaline in character and only three in number. This patient is still under occasional observation and has been during the six years since the first consultation. The last clinical record made was March 31st, 1911. His urine still contains a trace of albumin at midday; no casts. His blood-pressure is 120 mm. sitting and 110 mm. lying. General physical examination negative. The lad has developed normally being now at the age of eighteen, 5 ft. 11¾ inches in height, and he weighs 153 pounds.

The albuminuria in this case displays the characteristics of the orthostatic form coming on only after the upright position is assumed, reaching its maximum during the middle portion of the day and declining in intensity toward evening (Pavy's Cyclical Albuminuria). The inverted blood-pressure record, higher while lying than when upright (the reverse or normal), is a characteristic of these cases and indicates their vaso-

motor origin. The acetic acid reaction (euglobulin, nucleo-proteid?) is also a suggestive indication, as it is present in a majority of the cases.

Orthostatic albuminuria is the most interesting and one of the most frequent forms of albuminuria encountered in early life. It is met with most frequently in young lads at or about the age of puberty and is due to arterial hypotonus in the splanchnic circulation. In the normal individual, the vasoconstrictor mechanism is sufficient to overcome the drag upon the blood-mass constituted by the force of gravity, when the upright position is assumed, and thereby the systemic blood-pressure is maintained, rising indeed slightly above pressure-level of the lying position—an overcompensation due to the activity of the vasoconstrictors on the splanchnic circulation. In certain individuals there is a failure of this mechanism to act efficiently so that blood collects in the capacious splanchnic vessels in the upright position. In consequence of this engorgement, static hyperemia of the kidneys results, the renal filter is forced, and albumin appears in the urine. A condition somewhat similar in the method of its production is sometimes observed after prolonged debilitating diseases such as typhoid fever when, during the early part of convalescence, the vasomotor mechanism seems to be off guard, and albumin appears in the urine for a time after the resumption of the upright position.

The upright position is in itself sufficient to bring albumin into the urine. Exercise will not increase it, indeed appears at times to diminish its amount, and neither activity nor passive movement in the recumbent position has any such effect. Individuals developing this symptom are usually thin and long-waisted, subject to blushing, nose-bleeds, and vertigo, and are usually, although not exclusively, males. Although most frequently originating about the period of puberty, it may last with diminishing intensity for many years. It does not lead to nephritis although a form of albuminuria closely resembling it may be the aftermath of acute nephritis occurring in children, as shall presently be described. It is time for the profession to more generally realize that vasomotor albuminuria is a distinct and harmless syndrome; that it is a frequent happening during adolescence; that it is not to be adjudged as nephritic in origin, but is to be granted a favorable prognosis, and is to be treated in a very different manner from nephritis.

The following procedures are suggested as means of identifying these cases: First and most important is the careful comparison of the systolic blood-pressure between the lying, sitting, and standing positions. The pressure is to be first taken while the patient is lying flat upon the back, then again immediately after, while he is sitting, and again while he is standing, the level of the sphygmomanometer being of course raised with each test until even with the heart. In orthostatic albuminuria there is an immediate fall of from 10 to 20 points in blood-pressure on the assumption of the sitting position, a deficit which may be slightly added

to when the patient stands upright. In a patient under observation two years ago the systolic pressure fell from 125 mm. in the lying to 95 mm. after rising to the sitting position. Change in posture caused a drop from 110 mm. to 90 mm. in another of my cases.

Secondly, the different urinations of the day voided into separate bottles on a two-hour schedule should be serially tested for the quantity of albumin present, and a curve of the albumin excretion made in this way. It will be found to pursue a more or less definite cycle, absent in the urine of rest, at its maximum toward noonday, declining steadily toward close of the day. The specific influence of the upright position should be tested by devices that will at once suggest themselves. This latter precaution is necessary because in almost all forms of albuminuria there are daily variations in the amount of albumin, the minimum being found in the morning. Darenberg and Moriez (*Revue de Médecine*, Sept., 1902) found only two exceptions to this rule in 100 observations. The time of occurrence of the maximum is somewhat uncertain and may, in different cases, vary between 11 a. m. and 5 p. m. The specific effect of change of posture alone is peculiar to orthostatic albuminuria.

Thirdly, the urine should be tested for the acetic-acid (euglobulin, nucleo-proteid?) reaction. The method is as follows: Dilute 3 to 5 c.c. of the urine to be tested with 5 to 6 times its volume of cold distilled water and acidulate strongly by adding 2 to 3 c.c. of 50 per cent. acetic acid cold, not heating. A diffuse cloudiness follows the addition of the acid, and this is euglobulin or nucleo-proteid. The urine of orthostatic albuminuria almost invariably shows this reaction. Although not absolutely characteristic of this form of albuminuria, since it occurs under other circumstances, it may be looked upon as a strongly corroborative sign, and may generally speaking be taken as indicating the comparative harmlessness of the albuminuria. The more abundant this reaction, the better the prognosis.

Many of these cases do not show casts in the urine-sediment even when the urine is heavily charged with albumin. This paradox does not hold good for every case, as hyaline casts may often be discovered if careful enough search is made for them. Unless the casts are of a degenerative type or are present in persistent and increasing number they should not be allowed to outweigh other considerations in arriving at the diagnosis of a harmless albuminuria.

3. *Residual (post-nephritic) albuminuria; Illustrative Case.*—In 1907 a young girl of sixteen was brought to me for advice regarding an albuminuria of two years' duration. The albuminuria had its origin in an acute nephritis complicating tonsillitis occurring in 1905 and characterized by edema and a high grade albuminuria. Although recovery had taken place in all other respects, the albumin never entirely disappeared from the urine. Except for a slight degree of anemia and a faint systolic murmur (hemic) over the heart, physical examination showed

nothing abnormal. Cardiac outlines were normal. Systolic blood-pressure 90 mm. (Stanton). The urine, many specimens of which were analysed, always gave plain reactions for albumin and frequently the acetic acid reaction as well. The type of albuminuria was continuous and slightly cyclical. No casts were ever found in the urine sediment. Twenty-four-hour quantitative analysis normal. The albuminuria was looked upon as of a harmless nature, and the patient was put upon an iron tonic and sent into the open air. Observation of this case has been continuous covering a period of four years. During the first two years the albumin persisted in the urine and then disappeared. For two years the urine has been uniformly free from albumin. There are no cardio-vascular changes. The present blood-pressure is 110 mm. (Faught). Although never a robust girl, the patient has developed in an average manner.

This form of albuminuria merits careful consideration. The name which has been given it—residual albuminuria—signifies its origin in a precedent condition which is usually, although not invariably, an acute nephritis. The type of albuminuria sequential to an acute nephritis may vary. In certain instances of which the foregoing case is a good example the albuminuria never exceeds the minimal type, but is continuous, the trace of albumin in the urine being practically constant. In other cases, and perhaps as frequently, the albuminuria assumes the cyclical character of the vasomotor type, and no doubt many a case of so-called orthostatic albuminuria has had its origin in a mild, acute nephritis complicating an infection of childhood, the urinary condition having escaped detection at the time through lack of routine analysis. The albuminuria, being discovered subsequently, it is interpreted, according to its type, as a primary vasomotor phenomenon. In common with the other albuminurias of early life already described, the urine frequently displays the acetic-acid reaction in association with serum-albumin, the reaction marking the case as of a harmless nature.

Next to acute nephritis the condition most frequently productive of residual albuminuria is nephrolithiasis. An attack of renal colic will often start an albuminuria that may be perpetuated for weeks and months, but without systemic evidences of a progressive nephritis. In post-mortem work it is a frequent experience to see in the kidneys indications of healed lesions, scars, or areas of atrophy showing where localized inflammatory processes once existed and became healed without detriment to the organ as a whole. It is possible for such localized transient foci of disease to give rise during their existence to a simple albuminuria without general indications of nephritis and which after a period disappears leaving its origin unexplained.

One of the most important, because least recognized, forms of albuminuria is that sequential to acute nephritis. Such cases are usually regarded as due to a developing secondary chronic nephritis and the patient is condemned to the irksome routine of nephritic therapy. While

it is quite true that many cases of progressive chronic nephritis have their origin in an acute phase it should be recognized that not all persistent albuminurias following acute nephritis are of this nature. In some instances a harmless residual albuminuria, having its origin in acute infective nephritis, may last for many months without any cardiovascular changes, with perfect renal elimination and with unimpaired good health. It is not surprising that mistakes in diagnosing this form of albuminuria are so frequent, for, unless the case has been under observation for considerable time, or a clear history of the antecedent acute inflammatory attack is forthcoming, the observer has no means of knowing that the symptom has been present for some time. This form of symptomless albuminuria is most frequently discovered at examination for life insurance, and there is liability to serious error unless the examiner is acute enough to be struck by the solitary character of the symptom. The paradox of albuminuria, without cardiac enlargement or disturbances of blood-pressure and with a urine normal in its general characters, should arrest attention and inspire investigation of the case which will generally disclose its innocent character.

4. *Chronic Non-Progressive Nephritic Albuminuria; Illustrative Case.*—C. H., a business man of excellent habits, first came under observation fifteen years ago at the age of forty. The cause of his seeking my advice was rejected at life insurance examination on account of albumin in his urine. Clinical data recorded at first consultation note an increase in the area of the superficial cardiac dullness, its left border being in the mid-clavicular line, the first heart-tone in the mitral segment being reduplicated. There was slight arteriosclerosis, the sphygmogram showing slight arterial tension. The total urine output for twenty-four hours was 1,500 c.c. with a normal quota of urine solids in every essential. There was one-half of one per cent. by centrifuge of albumin and the sediment contained numerous hyaline casts. Under advice, the patient has regulated his personal hygiene and diet on a conservative basis and has exercised much in a systematic way in the open air. He has remained during the fifteen years' interval, since the discovery of his nephritis, in exceptionally good health without a single day's confinement from illness. The last clinical record made four months ago was practically the same as that taken at first consultation. His urine still contains hyaline casts and about one-half per cent. of albumin. His blood-pressure has never been noted above 150 mm.

Examples of non-progressive nephritis in individuals before the age of fifty are not common. Renal albuminuria, due to nephritis occurring in youth and early middle age, will in the vast majority of cases prove progressive, and nearly always warrants a guarded prognosis. Occasionally, a case such as the foregoing comes under observation. The organic condition is a slight chronic nephritis without any acute phase, characterized by persistent but non-progressive albuminuria enduring for

years with slight cardiovascular accompaniments and casts in the urine. Under proper regulation of the diet and hygiene these cases appear to remain stationary for years with good general health and with little if any abridgement of the span of life.

This form of albuminuria is not to be confused with the trace of albumin and casts that are so frequent in the urine of arterio-sclerotic individuals. The latter condition is relatively very common and arises from arterial degeneration affecting the renal vascular circuit as a part of general arterial change. The age of these patients is usually advanced beyond the fifth decennary and they display more or less frank evidences of their senile changes elsewhere in the anatomy. The vascular end organs—retina, myocardium, kidneys—are particularly liable, on account of their structure, to develop nutritive changes, the granular alterations in the kidneys causing qualitative urinary findings. Distinction between the albuminuria due to a mild non-progressive nephritis and arterio-sclerotic renal atrophy is difficult and at times perhaps impossible. Appreciation of the fact, that albuminuria and casts in the urine, due to chronic nephritis in early middle life, may persist practically without change or increase for many years and apparently without great detriment to the patient, is of value principally as pointing the lesson that all chronic nephritis is not necessarily serious and that routine prognosis may often err.

5. *Hypertensive Albuminuria; Illustrative case.*—I was consulted in October, 1906 by a lady, fifty-four years of age, who, since the climacteric four years previous, had been much troubled with vertigo, flushings, palpitation, dyspnea of effort, precordial oppression, occipital pains, back-ache, and the necessity of rising several times each night to void urine. There was slight malleolar edema toward evening. Except for much chronic muscular rheumatism and habitual constipation, the personal history was devoid of interest. Patient's father died of "dropsy" at the age of fifty-eight, and one sister and a niece have diabetes. Chief physical findings on examination were a wiry incompressible pulse and a much hypertrophied heart free from murmurs, with a ringing second aortic heart tone. The systolic blood-pressure was 270 mm. The fundus oculi showed diffuse chorio-retinitis with small hemorrhages. The urine excretion was 1,500 c.c., specific gravity 1.015, urea 40 grm., a plain reaction for albumin and a few hyaline casts, some showing granular markings. This patient has been under continuous observation during the intervening period of four and one-half years. Her blood-pressure has never been observed to fall below 200 mm., and has attained the excessive height of 300 mm. During the past year she has developed a faint systolic bruit but compensation remains good, and she has no more edema than was noted at the first examination. Aside from occasional fresh retinal hemorrhages she has developed no complication and has pursued a fairly active life. The last recorded blood-pressure, April

10th, 1911, was 270 mm., pulse 78 and regular. The albuminuria has varied in degree with the blood-pressure, rising and falling in amount with increase and decline of the systolic pressure. The total urine excretion varies from 1,500 c.c. to 2,000 c.c. There has never been any uremic manifestation.

In discussing the albuminuria of arterial hypertension we touch upon one of the most interesting problems of urinary diagnosis. A decade ago such a case as the one just cited would unhesitatingly have been pronounced chronic nephritis. Blood-pressure gauging by means of the clinical sphygmomanometer has brought us to a very different viewpoint in the estimation of such cases. The first fact we have learned is that high blood-pressure and cardiac hypertrophy with albumin and casts in the urine do not necessarily always mean nephritis as once was supposed, but may exist as a distinct syndrome. We have learned the important fact that albuminuria often exists because of high arterial tension: a consequence not necessarily always a cause as formerly interpreted. High blood-pressure may be the primary event occurring quite independently of kidney disease. With hypertension established, the cardiac enlargement and albuminuria follow as consequences. The production of albuminuria is explained as follows: after a certain point in the morbid elevation of the blood pressure is passed—usually about 200 mm.—the permeability of the renal filter is forced and albumin appears in the urine usually accompanied with casts. Whether this is the correct explanation or not, the fact remains that in every case of arterial hypertension the urine becomes albuminous after the tension exceeds a certain point. I have observed this development over and over again in hypertension cases which during an aggravation of the high pressure will display albumin in the urine that subsequently disappears when pressure-values again moderate to the average for the case. Quantitative urine analysis, ophthalmoscopy, and a careful weighing of the clinical evidence must decide the diagnosis in these cases. The physician must take a wide survey of all the attending circumstances and keep the patient under observation before coming to a conclusion. The manner in which albuminuria is brought about in arterial hypertension is antipodal to the production of the so-called vasomotor albuminurias already briefly considered. Persistent non-nephritic arterial hypertension is due to morbid vaso-constriction in the vessels of the splanchnic circulation, probably from sclerosis of the arteries of that circuit. As a result the glomerular blood-current is at so high a pitch of tension as to cause the passage of albumin into the urine. This is the opposite of conditions in orthostatic albuminuria which is associated with morbid vaso-dilation in the splanchnic area, the albuminuria resulting from low tension in the glomerular vessels.

It is surprising that albuminuria, a symptom common to so many diverse conditions, both physiological and pathological, should in the

minds of so many of the profession still retain its ancient erroneous significance as a special sign of Bright's disease. It is inexcusable not to recognize that in a large proportion of cases it is not indicative of serious renal mischief. It is interesting in this connection to note the observations of Hastings and Hoobler (*Amer. Journ. Med. Sciences*, Vol. 83, 1907), who emphasize the discrepancy between the occurrence of albumin and albumin with casts in the urine, and the incidence of nephritis in a series of 5,000 urine analyses. In their series the total number of albuminous urines was 1,014 and the number of urines containing both albumin and casts was 474; whereas the number of cases that could be clinically diagnosed as nephritis was 125.

The greatest difficulty in practice arises in the attempt to distinguish between harmless albuminuria and that dependent on established structural disease of the kidney. Very often, of course, the meaning of an albuminuria is sufficiently obvious. The cases that give rise to perplexity are those in which the albuminuria constitutes the only or almost the only symptom. Various criteria have been suggested to differentiate serious from harmless albuminuria. Among these are the influence of posture, of diet, intermittency, quantity, etc.; but experience has proven that none of these factors can be depended on. Casts formerly so highly valued in the diagnosis of nephritis have been robbed of part at least of their significance. The introduction of the centrifuge has shown that casts may be present when the albuminuria is not of serious moment, as for instance where it occurs following exertion, in concentrated urine, in toxic irritation of the kidneys, etc. This applies not only to hyaline casts, but to the lighter forms of granular casts as well. However suspicious these bodies may be, they cannot alone determine the diagnosis of Bright's disease. On the other hand degenerative casts (coarse, granular, fatty, waxy) affords clear evidence of nephritis. The condition of the cardio-vascular system furnishes us evidence of the greatest value in the differentiation of albuminurias. If the heart and arteries present distinct evidences of morbid alteration, harmless albuminuria can be excluded. Elevation of blood-pressure with albuminuria points with a sure finger to pathological origin.

In cases of albuminuria in which the interpretation seems equivocal, one has no right to pronounce a grave diagnosis unless in addition to the albumin the urine also contains other indications of kidney disease, and cardiovascular signs coexist.

THE RELATION BETWEEN BLOOD PRESSURE AND BAROMETRIC PRESSURE, ESPECIALLY IN PULMONARY TUBERCULOSIS.

By J. L. POMEROY, A. B., M. D., of Monrovia, Cal.

Since the publication in August, 1908, of L. S. Peters'¹ observation showing that blood pressure was higher in pulmonary cases at an altitude of 6,000 feet than at sea-level, so far as I can find, no verification or refutation of his work has appeared. The problem is an interesting one and deserves careful study. Barometric pressure, commonly included by the profession and the laity when they speak of weather variations in general, has received but little careful study with regard to its influence on blood pressure. In a review of the literature, however, we find a comparatively large field of influence attributed to barometric differences. Among these are uremia (Babcock²), heart disease, with distended right ventricle, pulmonary hemorrhage and various obscure metabolic disturbances. In many of these conditions the conclusions have rested upon general clinical observations without specific attempt to employ laboratory methods. Much of the literature consists in speculative discussion. The value, therefore, of a series of accurate observations on blood pressure is very important. These observations, however, must be interpreted with care.

It must not be concluded that the chief value of the altitude treatment of tuberculosis rests in a certain influence upon blood pressure, unless those observations are sufficient in number and sufficiently controlled to exclude every element of error. The observations of Peters are not in accord with the best of similar records on healthy people, hence a résumé of this work is necessary in order to correctly determine the facts.

It is first necessary to consider the opinions of different writers in regard to the effect of altitude upon blood pressure. Peters states "blood pressure is higher here (Silver City, N. M.) than at lower altitudes or at sea-level." Smith³ at Fort Stanton, 6,200 feet, states "it has been scientifically established that blood pressure is lowered with increased altitude." Smith finds that pulmonary hemorrhage is not more frequent at high altitude than at sea-level, but the results are more often serious and especially in those with impaired circulation. Of 42 autopsies in hemorrhage cases, no less than 17 showed some form of serious cardiac disease. Here, then, may be the connecting link between the effects of barometric change and hemorrhage. Bullock⁴ agrees with Peters that altitude raises blood pressure in tuberculosis.

The bearing of pulmonary hemorrhage upon the problem of altitude and blood pressure is an important one, but it cannot be entered into here as the problem is complex in itself. The general conclusion must be that sudden changes in barometric pressure are responsible in part for blood-spitting. The facts, however, must be studied in regard to humidity, velocity of the wind, temperature and other atmospheric factors. At least one worker in high altitude finds hypotension in pulmonary tuberculosis, but does not give his readings (Bonney⁵). We therefore pass on to the consideration of the results of blood pressure readings in high altitude upon normal people. First, we consider the readings upon normal people who have lived in a high altitude for considerable time, and then we will show the results of a change from high to low altitude upon the blood pressure.

Gardiner and Hoagland⁶ at an altitude of 6,000 feet measured a large number of individuals who have lived in Colorado for over a year, and came to the conclusion that blood pressure was slightly lower than that given as normal for sea-level. They also show that prolonged residence in that altitude does not raise the blood pressure.

Experiments made to show the effect of ascent from 6,000 feet to 14,000 feet gave results which warrant the conclusion that this ascent lowered the pressure and increased the pulse. The fall which took place in this experiment in three and a half hours was not a transient one, for examination of employees who lived for a considerable time at the summit of Pike's Peak showed lower tension than at sea-level. Their conclusions were that the effect of high altitude was to lower blood pressure, that this result was a permanent one and that it was highly probable that the effect on the right side of the heart, the venous system and the capillary blood vessels on the surface of the body was that of dilatation. It might be said here that as the condition of dilatation exists to a considerable extent in pulmonary tuberculosis, one cannot see how a further dilatation would be at all beneficial, if the good results of altitude were to be ascribed to changes in blood pressure.

Sewall's observations⁷ upon the venous pressure, in Denver, show a positive increase at an elevation of one mile as compared with sea-level. Oliver⁸ finds that the venous pressure decidedly increases in going from London to Arosa (5,800 feet).

The conclusions of Schneider and Hedblom⁹ are very clear and emphatic, and their experiments were performed with unquestionable accuracy:—

1. A considerable elevation in altitude tends to lower systolic and diastolic B. P. and to increase the rate of heart-beat.
2. The fall of systolic pressure is slightly greater and more certain to occur than the fall in diastolic pressure.
3. A rise in diastolic pressure occurs in some individuals.
4. The influence of such factors as psychical states, eating and exercise, may obscure the influence of altitude on B. P.

5. The fall in B. P. and increase in heart-beat is most marked in the early part of the residence in higher altitude.

6. On a prolonged stay in higher altitude the heart-rate probably returns more nearly to the normal than the B. P.

7. Higher altitudes do not affect to the same degree the B. P. of all individuals.

8. Small elevation in altitude does not appreciably influence the B. P.

9. Those individuals most affected by high altitude seem to sustain the greatest fall of systolic B. P. and the greatest acceleration in the rate of heart-beat.

10. The heat of the summer season probably accelerates the pulse-rate. The average fall in systolic pressure varies between 0.8 and 21.9 and the diastolic between 0.9 and 11 mm., and the pressure tends to fall as the pulse-rate increases at the high altitude. (See table for review of literature.)

To recapitulate, we have shown that B. P. readings are of importance as relating to altitude from the standpoint of renal adequacy, cardiac action, pulmonary tuberculosis, pulmonary hemorrhage, and from an experimental view—viz., to supply data for associated studies, mountain sickness, metabolic studies and similar research work. It is established that the effect of altitude is to lower blood pressure, especially the systolic in normal individuals, that this occurs soon after reaching an area of low pressure and is not transient, but is shown in old residents. Having established these facts, we will take up the relation which pulmonary tuberculosis bears to them.

Peters' results are at variance with the summary of the observations as given, and it now is necessary to analyze his records. He made observations in 100 cases of pulmonary tuberculosis treated at an altitude of 6,000 feet.

TABLE SHOWING RESULTS OF ALTITUDE EFFECTS ON BLOOD PRESSURE.

Observer and Date.	Barometric reduction	Result on B.P.
Bert, ¹⁰ 1878.....	Pneumatic cabinet	Slight diminution.
Frankel and Geppert, ¹¹ 1883	Pneumatic cabinet	Rise equal to 20 mm.
Lazarus and Schyrmun- ski, ¹² 1883.....	Pneumatic cabinet	Fall of 15 mm. on reducing pressure one-half.
Mosso, ¹³ 1905.....	Pneumatic cabinet	Slight fall.
Liebig, ¹⁴ 1896.....	Pneumatic cabinet	Reduction in 2 cases. Increase in 2 cases.
Dietrick, ¹⁵ Sommerbrandt, Schreiber.	Pneumatic cabinet	Slight increase.
Camus, ¹⁶ 1903.....	Pneumatic cabinet	Lowered.
Cowan, ¹⁷ 1904.....	Pneumatic cabinet	Increase.
Crile, ¹⁸ 1903.....	Pneumatic cabinet	Decrease.
Bartlett, ¹⁹ 1903.....	Pneumatic cabinet	Decrease.
Gorbatschew, ²⁰	Altitude	Increase of about 35 mm hg.

Observer and Date.	Barometric reduction	Result on B.P.
Mosso, 1898.....	15,000 feet	No change.
Oliver, ²¹ 1901.....	5,800	Transient increase.
Gardiner and Hoagland, 1904.	6,000 14,000	Lowered. Lowered.
	1,700 ft. 2,000 9,000	
Schneider and Hedblom...	14,109	Decrease both systolic and diastolic.
Lortet, Friedlander and Herter, ²²	3,000 m. Altitude	Lowered. Raised. See
Conway, 1894.....	Altitude	Lowered. Huggard's
Kronecker, 1903.....	Altitude	Lowered. Handbook

We wish to state first that unquestionably his readings are high, a comparison between his averages and normal values at the same altitude showing that they are higher than normal individuals. We wish to point out also some apparent inconsistencies in his paper:—14 cases, which were apparently cured, showed on admission a pressure of 114 mm., on discharge 127 mm., a gain of 13 mm. The pressure of 51 third-stage cases showed 124 mm. Hg., only 3 mm. lower than his apparent cures at discharge. These cases show also a difference of 1 mm. from second-stage cases (26 cases=126) and 1 mm. lower than 23 first-stage cases.

PETERS' CASES—COMPARISON OF GENERAL TABLE.

<i>Apparent Cures.</i>	<i>Third Stage.</i>	<i>First Stage.</i>	<i>Second Stage.</i>
Number cases, 14.....	51	23	26
B. P. on admission, 114.....	Average B. P. 124*	128.2	125.7
B. P. discharge, 127*.....	(42 male 127) (9 female 119.1)		

Average increase, 13.

*c.f.

Analysis of these 14 cases shows that of the first-stage, 9 were apparently cured. These 9 on admission showed a B. P. of 116 mm. Hg. (whereas in his general table of 23 first-stage cases, the average pressure was 128.2; male 127.3; female 129.1). On discharge the average pressure was 128 mm. Hg. Again, of these 9 cases, 2 gained nothing, remaining stationary. One gained 1 mm., one gained 2 mm., one gained 8 mm., the remaining four gained 100 mm., averaging 25 mm., and thus raising the averages for the others. This shows that one cannot draw any conclusions from small groups of cases, as the individual variation plays too great a factor. The remaining five in the group gained only 11 mm., thus making an average gain for them of a little over 2 mm. Hence, out of 14 apparent cures supposedly under the influence of a pressure raising force, of the total gains made, five made less than 3 mm. and four made phenomenal gains,—each about 25 mm. Even then the average for 9 cures is only 3 mm. higher than that for the third-stage cases, only 1 mm. from the first-stage cases, and only 2 mm. from the second-

stage cases. According to this, apparent cures may show the same B. P. as third-stage cases, in fact differ but little from the averages of second, third and first-stage cases. Of the cures made from the second and third groups, the pressure on discharge showed lower values than his averages for first-stage cases. It is difficult to comment on these results, for either our classification is entirely inadequate, or one should not attempt to interpret blood pressure readings on the basis of classification at all.

ANALYSIS OF PETERS' TABLES.

Improved Cases.

No. of Stage Cases		
I.	3	Average on admission 124 mm.—discharge 131—gain 7 mm. Hg.
II.	11	Average on admission 110 mm.—discharge 129—gain 19 mm. Hg.
III.	18	Average on admission 114 mm.—discharge 126—gain 12 mm. Hg.

In the second-stage cases one gained 34 mm., one 30 and two 22. Four cases gained 108 mm. If we eliminate these cases from the table as being abnormal values (the case making the largest gain had a pressure of 96 on admission and 130 on discharge), the average is 119 on admission, 126 on discharge=gain 7 mm. instead of 19.

The third-stage cases show also abnormal value, 32-34-42 mm. (98-140, case 64) a gain of 108 mm. for 3 cases. Again, if we eliminate these 3 cases, Nos. 42-64 and 100—we find 15 cases averaging 116 on admission—125 on discharge, a gain of 9 mm.—as against 12.

Arrested Cases.

No. of Stage Cases		
I.	7	Average on admission 125 mm.—discharge 133—gain 8 mm. Hg.
II.	6	Average on admission 114 mm.—discharge 128—gain 14 mm. Hg.
III.	17	Average on admission 117 mm.—discharge 132—gain 15 mm. Hg.

Here again, if we eliminate case 86 (88-112) which shows a gain of 24 mm. we get a reduction to 5 mm. gain, instead of 8. Surely any table to prove scientific data should stand the test of dropping one case without altering the relative values.

In the second-stage cases, case 21 (104-134) shows an unusual gain of 30 mm. and has a marked influence on so small a group. Eliminating it, reduces the gain to 11 mm. instead of 14—as stated.

In the third-stage cases making an arrestment, we have one in particular, case No. 46, 130-172, makes a gain of 42 mm. Besides this we find two gain 20, one 26, two 16 and one 17 and one 18—a total of 8 cases=175 mm., an average gain of about 21 mm.—third-stage cases. The minimum pressure in this gain-making group is 100 (case 74, admission and discharge pressures, 100-126). The average admission rate for these 8 cases is 116 mm. Hg. If, now we eliminate these 8 cases from this group, we find 9 cases with an average admission rate of 119 mm., and discharge at 128, giving 9 mm. as the normal gain.

These revised readings show then:—

Improved Cases.

Stage	No. of Cases	
I.	3	Aver. B. P. on admission 124 mm.—discharge 131—gain 7 mm. Hg.
II.	7	Aver. B. P. on admission 119 mm.—discharge 126—gain 7 mm. Hg.
III.	15	Aver. B. P. on admission 116 mm.—discharge 125—gain 9 mm. Hg.

Arrested Cases.

Stage	No. of Cases	
I.	6	Aver. B. P. on admission 132 mm.—discharge 137—gain 5 mm. Hg.
II.	5	Aver. B. P. on admission 116 mm.—discharge 127—gain 11 mm. Hg.
III.	8	Aver. B. P. on admission 119 mm.—discharge 128—gain 9 mm. Hg.

Comparison of original averages and revised readings:—

Improved Cases.

Stage	Gains Original	Gains Revised Readings
I.....	7.....	7 mm. Hg.
II.....	19.....	7 mm. Hg.
III.....	12.....	9 mm. Hg.

Arrested Cases.

I.....	8.....	5 mm. Hg.
II.....	14.....	11 mm. Hg.
III.....	15.....	9 mm. Hg.

Progressive Cases.

I.	II.	III.
None	105-96	7
		109-105

These cases were far below the average for third-stage values, even on admission, 109—as against 123.5.

Unimproved Cases.

I.	II.	III.	No Cases.
1	4	2	7
128-102	148-150	148-138	

As can be seen, these cases were admitted with high tension, and in the cases of the second and third stage the values are very high, that is suggestive of nephritic conditions. It does not seem possible that cases of pulmonary tuberculosis will run such a pressure without serious complication—thus not due to the toxine of the tubercle bacillus. These values are very high even for normal people. Nothing is given to clear up these questions. Note the high values for third-stage cases.

Having shown some of the discrepancies in Peters' table for admission and discharge cases, we now take up the consideration of the general table. Our own studies were made with Stanton's and Janeway's instruments, using the 12 cm. cuff. All readings were taken in the sitting

position, between the hours of 9 and 11 a. m. We divide our studies in two groups:—One based on the careful work done by Pottenger²³ in investigating the effect of tuberculosis on the heart; the other on an analysis of the cases examined since the publication of his article, and not included in that report. I have taken Peters' general table No. 1 and separated the cases into groups for the purpose of comparison:—Stage I., male and female; Stage II., male and female; and Stage III., male and female. I wish to emphasize the observations of Pottenger calling attention to the palpability of the radial arteries, also the effect of the changes in the heart muscle in its relation to the B. P. These observations accord well with Thayer's²⁴ upon old typhoids,—of 4,000 cases examined at Johns Hopkins Hospital, the highest per cent. of palpable radials were found among cases with a history of heavy labor (57.6 per cent.). Next is alcohol (46.8 per cent.), and among the acute infections rheumatism came first (34.6 per cent.) and typhoid second (26.3 per cent.). Other infections were subordinate. The B. P. was found to be higher in every decade among old typhoids, sclerosis of the aorta was common (52 of 95 cases) and the average heart larger. Statistics on syphilis and gonorrhea were unreliable from the nature of the answers.

Peters' results on 18 cases with previous history of typhoid are not in accord with Thayer's work. The average pressure was 123 mm., which is less than the average for all cases.

Pottenger calls attention very forcibly to the relation of the heart and arteries to the B. P. especially in third stage cases. This is shown here in the Table by comparing the pressure of cases showing myocardial change and those not so complicated. "Further analysis of these cases seems to indicate that these two factors,—thickening of the arterial walls and degeneration of the heart muscle,—are two very potent factors in modifying the blood pressure in tuberculous patients. * * Where myocarditis was not present those patients, who had palpable radials, had a B. P. of systolic 113—diastolic 82, even higher than the pressure of the first and second-stage cases. In those of the same class, whose radials were not palpable, the B. P. was systolic 105, diastolic 83; making a difference of about 8 points in the systolic pressure, which seemed to be due to the condition of the arteries as determined by the radials." He further shows that cases with thickened radials show no increase if associated with myocardial changes. He suggests that this thickening, while helping to raise the B. P. in the early stage of advanced tuberculosis, may prove detrimental later, because of the increased strain put upon the heart. That we must look upon the efficiency of the heart and arteries as being of great importance in explaining the variations in B. P., cannot be gainsaid, since "myocardial change is present in some degree in practically all cases of tuberculosis beginning very early as a hypertrophy of the right ventricle. Later through toxic action the muscle degenerates

and weakens." Here also we must remember that the contractions and adhesions ever present must cause additional mechanical difficulties in the way of proper functioning by the heart and vessels in the chest cavity. The venous stasis in the abdomen, due partly to deficient diaphragmatic activity, is likewise a potent factor in bringing about cardiac embarrassment. In order to appreciate fully the meaning of blood-pressure records, we must take all these factors into consideration.

TABLE SHOWING COMPARISON OF PETERS' CASES AND OURS AND ILLUSTRATING THE EFFECT OF MYOCARDITIS.

Stage	Sex	No. Cases	Sys. B. P. Peters	Pottenger No Myocard.	Myocard. Present	Admission	Discharge	Gain.
I Peters	M	17	127.3					
I A	M	11		112.	none			
I B	M	14				113.	122.	9
I Peters	F	6	129.					
I A	F	8		109.	none			
I B	F	5		110.		110.	115.	5
II Peters	M	20	126.4					
II A	M	8 & 1* 9		110.3 107.5	85.*			
II B	M	27		107.		107.	111.	4
II Peters	F	6	125.7					
II A	F	4		116.				
II B	F	14		107.			121.	14
III Peters	M	42	127.					
	M	43			102.			
III A		33		110.				
III B	M	39		114.		114.	121.	7
III C	M	15			100.		99.	Died in 1 year.
III Peters	F	9	119.1					
		28			93.			
III A	F	24		107.				
	F	31		110.		110.	117.	7
III B	Early	18		109.		109.	117.	8
	III Stage	10		111.		111.	122.	11
Total cases		433	100	246	87			

The letters A, B, C, refer to series of cases at Pottenger Sanatorium.

On page 13 of Peters' article, he states "the difference in pressure in the three stages is so slight that we believe that the degree of involvement and the blood pressure bear no relation to each other. However, that the B. P. tends to increase with improvement in the pulmonary condition is shown by General Table II." This belief is also expressed by Janeway. It would seem at first thought that this is an anomalous condition—yet it is a fact which only emphasizes the real unsatisfactory

basis upon which our classification rests. The classification at present used cannot possibly express the exact status of the patient, as it is so purely anatomical that for clinical purposes one gets all sorts of apparent contradictions. The classification does not point out clearly the amount of toxemia present. We may, and often do, have a greater toxic state present in a first-stage case than in more advanced conditions, yet I believe with careful scrutiny one can separate the individual factors to one's satisfaction. The confusion is more apparent than real.

From a careful examination of these factors, one may state the following:—

1. The blood pressure bears a direct relation to the toxemia of the tuberculous patient. This toxemia may be greater in the patient who is in a primary anatomically-involved condition, than in a second or third stage. Hence this classification should rest upon the basis of toxemic state. One should eliminate from the first stage, considering the term broadly, all cases showing marked toxemia. Whether we can do so on the basis of the presence or absence of fever is questionable. By properly eliminating our cases in this way, one can intelligently interpret our results.

2. Again, one must group these cases according to the condition of the heart, whether myocardial changes have taken place, whether there is presence or absence of displacements, enlargements or atrophy, and mechanical effects due to pericardial or pleural adhesions, viz., apical around the subclavian artery, etc.

3. One must again separate those cases showing the influence of previous states, especially certain diseases causing arterial changes—syphilis, rheumatism, typhoid fever, etc. Also other influences having no connection with the tuberculous condition—occupation, nervous condition, psychic disorders, nephritis and similar factors.

4. The pathological states peculiar to the individual also require consideration—emphysema, enlarged bronchial glands, and other mediastinal conditions. Comparison of the two sides may reveal differences, which must be averaged. The presence of cervical rib (2 cases), and other unusual factors must be looked for.

It is thus readily seen that if one attempts to estimate blood pressure under the classification usually adopted, it can only lead to confusion. On the other hand, by a study of individual cases, and placing them in similar groups, it is then possible to make comparisons and gain useful facts.

Peters states "our results may be partly due to the stimulating effect of the dry mountain air, which increases the blood pressure, through building up of the general circulation. The results of blood-pressure observations in our cases, far from being indicative of tuberculosis, would signify almost perfect health; in fact, as a diagnostic sign blood pressure plays a minor rôle." There is no question that Peters' readings do compare very well with healthy individuals; but is this as it should be?

The results of the physiological experiments show that his readings are actually higher than in normal people at the same altitude. No matter how slight the lesion may be, in pure pulmonary tuberculosis, one cannot, from my experience, expect to find any influence upon the blood pressure than depression; and barring other influences this depression occurs at the very earliest. From the data which has been brought out, Peters' comparison to the normal cannot but be overdrawn. Experimental results with tuberculin show depression of the B. P. in most minute dosage. If variations take place they cannot certainly be taken as in any way controverting the rule.

CONCLUSIONS.

1. The results of nearly all experimental data show that the effect of diminished barometric pressure upon the human organism is to lower the blood pressure. This result is not transient, but permanent. While the pressure may rise slightly it does not reach its former level.

2. Whatever results to the contrary may have been obtained in pulmonary tuberculosis, must be ascribed to insufficient care in technique, to wrong methods of averaging readings; therefore such results cannot be taken in any conclusive way.

3. There is evidence to show that hemorrhage cases, especially those of fatal tendencies, occur most frequently in patients with cardiac and arterial disease, and that these cases are more fatal in higher than in lower altitudes.

4. There is no reason to believe that patients make any greater gains in B. P. in higher than lower altitudes.

5. Changes in barometric pressure, especially when sudden, bear a direct relationship to pulmonary hemorrhage, and probably may be explained upon the basis of a sudden increase in intrapulmonary blood pressure.

6. The study of B. P. in pulmonary tuberculosis on the basis of the National classification,—I., II., and III. Stages—leads to incorrect conclusions, and is eminently unsatisfactory. It is only by careful individual analysis, regardless of classification that one can properly interpret blood-pressure readings.

7. Especially desirable is it to study the condition of the heart and arteries in pulmonary tuberculosis, particularly from the standpoint of prognosis.

8. It is important to take the B. P. in both arms and average the results, since there exists slight differences in the two sides, due partly to left- or right-handedness, and partly to apical adhesions about the large vessels.

9. The chief influence of higher altitude upon the metabolism shows itself in chemical changes in the tissue fluids, and there is no evidence to show that there is any specific influence causing higher B. P. in the periphery. From a theoretical standpoint such a condition would not

only be undesirable, but would very likely lead to serious damage to the pulmonary circulation.

10. The study of B. P. in pulmonary tuberculosis deserves further attention, because of the great importance of the heart and arteries in this disease.

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A PRELIMINARY COMMUNICATION CONCERNING A NEW DIAGNOSTIC NERVOUS SIGN.

By CHARLES GILBERT CHADDOCK, M. D., of St. Louis.

In order to justify such an assumption as my title indicates, it is necessary to show that what I call a new sign has not been described to my knowledge; that it is an independent manifestation, elicited in a definite way, and capable of affording diagnostic evidence of importance; that it does not occur in health or in a haphazard fashion in disease; that for practical purposes it does not require a technique too complicated for routine application; and that its manifestation is clear enough for reliable interpretation.

Such a sign I think I have found in extension of one or more, or all, of the toes, with or without fanning of them, when the external infra-malleolar skin area is irritated, in cases of organic disease of the spino-cortical reflex paths. I shall call it the external malleolar sign.

Some months ago, in making examinations of patients, I was struck by the ready occurrence of the Babinski phenomenon when the same form of irritation that had elicited it from the sole, was applied just beneath the external malleolus, while no response could be obtained from other skin areas of the lower extremity. In cases where irritation of almost any area of skin over the lower extremity and lower abdomen called forth extensor toe-response, the external infra-malleolar area did not distinguish itself in any way.

Impressed by the ready external malleolar response, I became accustomed to begin examinations of the skin reflexes by irritation of the external infra-malleolar area. I thought I could always foretell thus what response would come from the sole; *i. e.*, with any response in the sense of extension of one or more, or all, of the toes, or with fanning of them, I predicted a Babinski from the sole; with no malleolar response, I predicted normal plantar flexion. Very soon, however, I found I could not predict; that what I was expecting failed to occur. I noted the following variations between the relations of external malleolar non-response and response: (1) in one case of left-sided cranial fracture with no external malleolar response, there was for some days *complete abolition* of the right skin reflexes with final return of normal plantar; never any malleolar response; (2) in a number of cases in which I obtained a response from the external malleolus, I obtained normal response from the sole; (3) in a few cases after persistence of external malleolar response and normal plantar response, plantar response

became abnormal for a time, then disappeared, leaving external malleolar response, which finally disappeared; (4) in other cases with initial plantar and external malleolar response alike of extension, plantar abnormal response changed to normal plantar response, leaving malleolar response persistent; (5) in many cases in which plantar response was mixed; *i. e.*, showing flexion and extension and varying strikingly with place or intensity of irritation and with voluntary jerks, external malleolar response removed any doubt of the nature of the plantar response; (6) in several cases of articular deformity limiting movements of the toes, the absence or presence of external malleolar response was decisive for diagnosis.

In no case presenting frank toe-phenomenon from the sole have I ever failed to elicit the external malleolar sign*; in several cases presenting no Babinski and many presenting doubtful Babinski, I have found the external malleolar sign reliable as indicative of central lesion proved by operation to exist, with its disappearance after operation. I have seen it develop alone, to be joined by a Babinski, and persist after Babinski had changed to normal; I have failed to find it once in a case of abolition of all skin reflexes from cerebral lesion without Babinski; I have never seen it in a normal individual.

I have found it alone (without Babinski) in general paralysis, in skull fracture, transitory unilateral brain lesions, in old hemiplegias, and in undetermined brain lesions, single and double. I have found it in cord lesions. Never have I found it in peripheral lesions or in unmixed tabes. I am now studying the matter particularly in paretic dementia and infants, and adding to my observations of the phenomenon in normal and abnormal cases daily.

The cases, of which I have histories, that are the basis of my observations now number 245. Among these are normal cases, alcoholics, epileptics, tabetics, paretics, hemiplegics (single and double), myelitics, neuritics, and a great variety of cases otherwise classifiable; and most important of all, thirty-six cases of skull injury—fracture, gunshot penetration, and trauma capitis; and among the skull cases there are twenty-two fractures actually demonstrated, eighteen recent, four old; of the fourteen cases classified as trauma capitis merely, some probably were cases of skull fracture.

It is not my purpose to cite cases here in all detail, but to indicate, if possible, the grounds of my assumption and thus make the subject of sufficient interest to incite you to examine the matter yourselves, with a view to prove or invalidate my claim.

*My colleague, Dr. Sidney I. Schwab, has noted one case in which the Babinski phenomenon was present without the external malleolar sign; I have seen one instance of double Babinski in a case of probably paretic seizure (convulsive) ending in death (no autopsy), in which there was no external malleolar sign and no other sign of increased spinal reflectivity.

Case I.*—Mary B., aged six years. (Service of Dr. Rassieur.) Slight fall; grew unconscious during night several hours after injury. Seen next day at 10 a. m.; very small lump above left ear; somnolent, but waking and protruding tongue when asked to do so; signs of slight paresis of right side. Deep reflexes normal; extension and fan of toes on right side from right external malleolus; normal flexion of right toes from sole, but Babinski can be occasionally noted from sole. Babinski on right side was overlooked or not interpreted by good observers. Left external malleolar sign with flexion of toes from sole. Diagnosis: increased intracranial pressure from hemorrhage, probably on left side. Operation revealed large extra dural hemorrhage on left side. Abnormal pressure signs all disappeared within a few hours after operation; recovery. Fracture was not found under hematoma, but only when skull was denuded for decompression.

Case II.—Edward H., aged ten years. (Service of Dr. Blair.) Fall from tree; entirely conscious, never unconscious; no sign of skull trauma whatever. Slight weakness of entire left side. Complaint of headache. Reflexes: superficial; right side: nothing from external malleolus; normal flexion from sole; left side: extension of toes from sole and from external malleolus and from external malleolus to ethyl chloride spray; but no reaction to ethyl chloride from left sole. Subtemporal decompression done on right side; great pressure found but no hemorrhage. Regained power immediately on left side, then lost it, then slowly regained it. Reflexes remained the same as before operation except that normal plantar flexion returned on left side leaving left external malleolar sign at the time of his discharge.

Case III.—W., male, colored, aged seventeen. (Service of Dr. Babler.) Trauma capitis, May 23rd, 1911. Unconscious a few minutes after blow, pain in head. Left side, a large hematoma. Incision revealed no fracture; pulse slow and so continued 44 to 68. No paralysis; *no disturbance of reflexes*; mind clear. Lumbar puncture gave bloody fluid. May 25th, 26th, 27th and 29th, external malleolar sign on right side with normal plantar on right side. All other reflexes normal. External malleolar disappeared. Recovery.

Case IV.—Tom W., aged thirty-six years. (Service of Dr. Blair.) Severe skull fracture eighteen months ago; no operation. Mentally dull since. Deformity of forehead from healed fracture. Suspicion of general paralysis; Wassermann negative; lymphocytosis of spinal fluid; Argyll-Robertson pupil; history of a chancre. All deep reflexes very lively; no clonus. Normal plantar flexion on both sides; external malleolar sign perfectly developed on left side.

Case V.—Congenital imbecile, male, adult. Apparently normal physically. All deep reflexes absent in legs. Double external malleolar sign perfect; normal plantar flexion. (Observation service.)

Case VI.—T., aged fifty-six years. (Service of Dr. Schwab.) Right hemiplegia, with all classic signs. After several weeks began to walk, having normal right plantar flexion, but malleolar sign remained on right side.

Case VII.—Clayton G., emergency. (Service of Dr. Babler, May 8th, 1911.) Depressed fracture of left upper parietal region. Never unconscious. Craniotomy by Dr. Babler. Neurological examination May 9th. Normal reflexes both sides, no reaction from external malleoli. The feet are peculiar in that there is a general contracted position of all toes so that they are drawn upward and tips curled under. Irritation of soles causes slight upward movement of toes. The absence of external malleolar sign removes all doubt, and did so in emergency room before operation. Discharged recovered.

Case VIII.—George E., emergency case, 10 p. m., May 20th, 1911. (Reported by my interne, Dr. Deppe.) Hematoma over left occipito-parietal region. In-

*All cases here cited are from the records of the St. Louis City Hospital.

cision and operation showed extra dural clot; removed; stertor; pupils dilated and fixed; abdominal and cremastic reflexes absent; knee-jerks absent; ankle-jerks not tested. Babinski on right side, also right external malleolar. External malleolar on left side. Just before operation Babinski found—had developed on left side. Death.

Case IX.—William K., adult. (Service of Dr. Blair, May 5th, 1911.) Received with history of head injury. Incision right hematoma revealed no fracture. Seen at 10 a. m. Semiconscious, restless, no paralysis. Face smoother on left side than right. All reflexes normal, including pupillary reactions, but skin reflexes show following peculiarities: irritation of left sole causes flexion of toes. Under repeated examination there was occasional extensor movements from left sole. Extension of toes marked from scratching under left external malleolus and from ethyl chloride spray,—nothing from sole to ethyl chloride spray. Diagnosis of Babinski had been made by Dr. Hagler in presence of plantar flexion. Right side normal reaction from sole, nothing from malleolus. Right subtemporal decompression done; massive hemorrhage with brain laceration found. Patient has recovered but shows mental disturbance. Reflexes from sole normal—no malleolar.

Case X.—No. 931. Unknown male, aged thirty-five years. (Service of Dr. Max Myer, May 8th and 9th.) Alcoholic. History of having been in a fight, going home and of coming in a second time unconscious, after having had stomach washed out in emergency room at first visit. Head shaved—no hematoma found. Black eye developed on right side during morning of May 9th. Seen at 10 a. m. Semiconscious, restless, no real paralysis, but left side weaker than right; pupils wide, inactive, conjugate deviation to right. All reflexes, deep and superficial, with the following exceptions, normal: repeated examination by Dr. Hagler had revealed no Babinski. I found the external malleolar sign present on the left side with normal plantar flexion, and also the external malleolar sign excited by ethyl chloride spray. Examined at ten, eleven, twelve, twelve-thirty, and one o'clock, found the same anomaly and demonstrated it to several medical men. In the afternoon four lumbar punctures were made; no blood found, but fluid reported turbid. Patient clearing mentally. May 10th, patient mentally clear. Denies lues; gives history of blow on right side of head eight years ago with resultant weakness of left arm. Pupils now equal and reacting normally, but left consensual is more active than right. Plantars normal on right; on left occasional Babinski from sole, always external malleolar sign.

May 11th, no left Babinski—normal flexion—no external malleolar sign. There was clear evidence of weakness of left arm. Patient gave history of severe similar attacks due to even mild drinking. Diagnosis: pachymeningitis, chronic; cerebral symptoms aggravated by congestion and edema—actually relieved by rachicentesis. Recovered from acute condition.

Case XI.—Mike K., thirty-three years. (Service of Dr. Blair.) No history. Received unconscious. Three hours or so without Babinski, then found on left side. Operation low temporal decompression on right side finding large extra dural clot. Wound closed; dura not opened. Next morning, at Dr. Blair's request, examined patient. Patient had not improved. Found no actual paralysis; moved left side less than right. Toes on both sides seen in attitude of extension. On left side extension of toes easily induced from sole and from external malleolus. On the right side, nature of reaction less clear because foot is jerked away, but ethyl chloride spray removes all doubt, causing perfect Babinski on both sides and giving the external malleolar sign on both sides. Dura was opened in old wound and copious hemorrhage found. Patient died next morning from pulmonary edema.

Case XII.—John F., thirty-one years. Alcoholism. Syphilis twelve years ago. Right malleolar sign most perfectly developed; fanning of little toe on left side; perfect plantar flexion on both sides. All deep reflexes very lively. Pupils unequal, left pupil fixed. No reflectivity from indifferent areas. Superficial reflexes otherwise normal. Diagnosis: cerebral syphilis. No actual sign of general paralysis. No reaction to ethyl chloride spray.

These and many other cases have proved to my satisfaction that irritation of the external infra-malleolar area causes no reaction normally; that the external malleolar sign is usually present when Babinski is present; that it is often present when Babinski is absent; that it may come before, accompany a Babinski, and outlast it; that its presence or absence is a great clinical aid in the interpretation of doubtful or occasional abnormal movements excited from the sole; that it signifies disorder of an organic nature in the spino-cortical reflex paths.

I have used the same kind of irritation to induce the external malleolar sign that is used customarily to elicit Babinski's sign.* But I would explain some foregoing allusions to ethyl chloride spray as an excitant. I began its use in searching for the possible reaction to cold in abnormal cases, and I found in many cases, not all, that abnormal reaction was induced with astonishing ease. In some doubtful cases, it made matters clear at once. I have found it of value in localizing the level of involvement in cord lesions—but that is another story. I had tried ice before successfully in searching for Babinski's sign, and in using ethyl chloride I was simply trying the effect of cold with the element of material stimulation reduced to a minimum. Normally, we rarely, if ever, get any reflex reaction to an ethyl chloride spray. And permit me to suggest that ethyl chloride spray might be used to facilitate the difficult examination of the temperature-sense, eliminating thus the sense of touch as far as possible.**

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*The degree of irritation (I use a moderately pointed nail-file) should be varied. In some cases the merest touch is sufficient to excite the sign; in others, rather severe scratching may be required. Usually the most sensitive point is a slight depression just in front of the lower point of the external malleolus and behind the tuberosity of the cuboid, but sometimes the movement occurs more readily when the posterior groove is scratched.

**Subsequent observations, incorporated in a paper read before the Society of the St. Louis City Hospital Alumni, show that even plantar flexion of the toes excited from the external malleolus is as significant as extension or fanning of them; that in cases of unilateral capsular lesions, the external malleolar sign occurs often on both sides—on the paralyzed side with Babinski, on the unparalyzed side without Babinski (homologous motor fibres). It has been found pure and unilaterally in two cases of cerebrospinal meningitis (epidemic), and in a case of tuberculous cerebrospinal meningitis. It has been found in one case (no nervous lesion apparent) from the ankle where the foot had been dislocated forward creating an arthritis—which suggests some possible relation between this sign and arthritic ankle clonus.

TUBERCULIN THERAPY IN CLINIC AND OFFICE PRACTICE.

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In the beginning of March, 1910, at the Presbyterian Hospital Tuberculosis Clinic, and for a few patients in private practice, a trial was made in the administration of tuberculin to ambulant patients. This was done at first with some misgiving, and doubt as to the results to be achieved in this class of patients, for until the past few years it had generally been considered best to limit specific treatment to cases in sanatoria where they could be under constant supervision. The cases here reported have not been selected as especially favorable, but largely on account of their willingness to continue treatment regularly and faithfully for a period of at least three months, as results cannot be expected within a shorter time. The patient must also be trained to keep an accurate chart of his temperature at four hour-intervals. A record of the pulse is made at the same time, and he is instructed to note carefully any symptoms of malaise, pains in the back or limbs, headache, nausea or vomiting, increased cough, dyspnea, prostration, or any change in the subjective condition following the injections. The majority of cases here reported have been late incipient or second stage patients who have had dietetic and hygienic treatment under favorable conditions at sanatoria or the day camp. They had been under observation for a year and a half or two years and their condition was stationary, or they were losing ground. It is evident that such cases offer a severer test of the tuberculin treatment than cases appearing for treatment for the first time, that coincidently with the specific treatment are placed on the ordinary fresh air and dietetic methods. Many cases of incipient pulmonary tuberculosis do extremely well with hygienic and dietetic measures alone. When, however, these measures have been tried for many months and with little permanent result, the conclusion appears to be irresistible when the tuberculin treatment is added, that such improvement as results may be fairly ascribed to the influence of the tuberculin and the tuberculin alone.

In every case here reported Koch's old tuberculin has been employed. There are many varieties of tuberculin, but it has been felt that more has been known and published regarding Koch's original preparation. There is an ample literature concerning it, it has been longer in use, and it is believed that all varieties owe whatever efficiency they may possess to

the substances contained in Koch's original glycerine filtrate. In no case has it seemed necessary to begin with a lower dosage than 1/20 mgrm., nor has it been necessary in order to obtain results which have often surpassed anticipation to push the tuberculin to the large maximum doses advised by some writers. In no case in this series has the patient received more than 15½ mgrm. But one general reaction has been observed and that was slight and transient, and apparently not productive of any harm to the patient. The injections have been given with the usual antiseptic precautions in the areolar tissue above the spine of the scapula, alternating from shoulder to shoulder. There have been no abscesses and very little local discomfort.

Case I.—Jennie M., *aet.* seventeen. Came under treatment May 1st, 1908. Mother, two maternal aunts, and a maternal uncle died of consumption. Another uncle has pulmonary tuberculosis. Typhoid fever seven years ago. Winter cough for several years. Purulent sputa, hemoptysis at times, chills and fever, profuse night sweats, loss of flesh and strength, dyspnea on exertion, poor appetite. Amenorrhea for two months.

On physical examination, pale, ill-nourished, stoop-shouldered. Marked dullness over both upper lobes, breath-sounds rather diminished. Temperature 99.4° F., pulse 100, respiration 22. Weight 103½ pounds. Von Pirquet tuberculin-test negative. No tubercle bacilli in the sputum. She was placed on dietetic and hygienic treatment and was admitted to the Middletown day camp. On October 9th, râles over the right apex. Temperature 100.8° F., weight 112 pounds. December 11th, rather profuse hemoptysis. She has marked atrophic rhinitis. On February 26th, 1909, she was admitted to the Adirondack Cottage Sanatorium where it was stated that tubercle bacilli were detected in the sputum. She returned September 27th considerably improved. The râles had disappeared, she had gained a little in flesh and strength. Temperature 100° F., weight 113½ pounds.

She had considerable hemoptysis and one rather profuse hemorrhage while at the sanatorium. During the month of October she did rather poorly. Her temperature ranged from 101° to 102° F. She had severe chest pains, felt much prostrated and was kept in bed for several weeks. January 31st, 1909: She has a poor appetite, frequent chills, and profuse night sweats. Tubercle bacilli absent from the sputum. On March 9th, tuberculin treatment was instituted, beginning with an initial injection of 1/10 mgrm. Temperature, 99.6° F., pulse 104, weight 111½ pounds. The tuberculin treatment was continued in gradually increasing doses up to June 27th, when she was much improved and went to the country. She had 31 injections in all, the last and maximum dose 5 3/5 mgrm. Her cough and hemoptysis practically disappeared. She was seen again on November 25th, when she stated that she had had no cough since last August. No expectoration or active pulmonary signs.

Moderate dullness over right upper lobe, percussion note high pitched over the left. Temperature 98.6° F. Under date of December 28th, her improvement has been maintained, she has a good color and she feels very well. She has no cough or expectoration. Temperature 98.4° F., weight 113 pounds.

Case II.—Amelia M., *aet.* twenty-two, a dress-maker. Family history negative as to tuberculosis. She had measles as a child, no important illness since. She first came under observation June 12th, 1908, with a history of cough of six months duration, purulent sputa, hemoptysis, loss of flesh and strength, fever afternoons, night sweats for three months, pains in the chest; fair appetite, but poor digestion, menstrual function regular.

On physical examination, pale, poorly nourished, marked dullness and bronchial breathing, whispering bronchophony over both upper lobes; over the left behind, pleuritic friction sounds. Temperature 101° F., pulse 126, respiration 22. Weight 87½ lbs. Six months previously she weighed 100 lbs. Tubercle bacilli present in the sputum. She was put on dietetic and hygienic treatment and improved considerably as regards cough, expectoration and temperature. On December 8th, 1909, her general condition however was not very satisfactory. Temperature 98.4° F., weight 99 lbs. She was not at all strong, and tuberculin injections beginning with 1/10 mgrm. were begun March 9th, 1910, were continued twice a week, and increased up to 9 1/5 mgrm. as a maximum dose. She had 66 injections in all. Tubercle bacilli disappeared from the sputum. November 15th, 1910, on physical examination there were dullness and bronchial breathing over both upper lobes, more marked over the right. No cough or expectoration, and she feels much stronger. Temperature 98° F., pulse 72, weight 105. Under date of December 30th, her marked improvement has continued and she considers herself well.

Case III.—Louise M., *aet.* nineteen, cigarette packer. A maternal aunt died of tuberculosis of the lungs. A brother has recently become tuberculous and is at the Otisville Sanatorium. She came under treatment on February 10th, 1908, with a history of cough for a year, purulent sputa, occasional hemoptysis, loss of flesh and strength, fever afternoons, pains in the right chest, appetite and digestion fair; menstruation regular. On physical examination, she is slight and poorly nourished; dullness, bronchial breathing, whispering bronchophony, fine râles over both upper and right middle lobes. Temperature 99.6° F., pulse 86, respiration 24, weight 95 lbs. Tubercle bacilli present in the sputum. Von Pirquet tuberculin-test positive. She was put on hygienic and dietetic treatment and attended regularly the day camp at Middletown. In June, 1909, she was in bed for two weeks with a severe hemorrhage. Temperature ranged between 98° and 100° F. In July she was admitted to the Otisville Sanatorium, but remained only a few days. January 7th,

1910, tubercle bacilli were still present in the sputum; she weighed 97½ lbs. She had frequent hemorrhages and was rapidly losing ground. On March 9th, tuberculin treatment was instituted beginning with an initial dose of 1/10 mgrm. which was continued twice a week with continually increased doses up to a maximum of 12 mgrm. She had 82 injections in all up to January 6th, 1911. She has gradually improved in strength, tubercle bacilli have been absent from the sputum since June 7th. Temperature normal since July 23rd. Her râles have entirely disappeared, and she has no cough or expectoration. She is feeling very well and contrary to advice was married during the summer. At no time during her treatment did she have anything approaching a general reaction. She had one stitch reaction. Under date of January 30th, 1911, her improvement has been maintained. Temperature 98.8° F., pulse 80, respiration 20, weight 98 lbs., which is equal to her best weight before she was ill.

Case IV.—Anna A., *aet.* nineteen; family history negative as to tuberculosis. She came under treatment March 26th, 1909, with a history of cough for five years, muco-purulent sputa, no hemoptysis, considerable loss of flesh and strength, chills, fever afternoons, pain in chest; appetite and digestion good, menstruation regular.

On physical examination, she was fairly well nourished, dullness, increased breathing and whisper over the right upper lobe; impaired resonance over the left apex. Cervical glands are considerably enlarged. Temperature 100° F., pulse 98, respiration 24, weight 114 lbs. No tubercle bacilli detected in the sputum. She was placed on dietetic and hygienic treatment, and on March 21st, her weight had increased to 130½ lbs., with a considerable improvement in her symptoms and general condition, but her temperature ranged between 99.4° to 100° F., May 15th; she had been hoarse for two months. Throat examination showed her vocal cords slightly reddened, no infiltration or suspicion of tuberculous involvement. Has not been doing as well, has lost some weight and has continued to run an afternoon temperature. Weight 129 lbs. On June 3rd she was placed on tuberculin treatment receiving an initial injection of 1/10 mgrm., which has been increased to 4 3/5 mgrm.; had two injections a week, 41 in all. On November 14th, no tubercle bacilli present in the sputum. November 26th, temperature, 98.8° F., weight 141 lbs. Cervical glands have diminished in size. Her cough is slight and she feels much better.

Case V.—Tillie Z., *aet.* nineteen, has been under treatment since October 16th, 1908. No tuberculous family history. Cough for a year, muco-purulent sputa, no hemoptysis, marked loss of flesh and strength, fever afternoons, occasional pain in chest, appetite and digestion poor, has missed one menstruation period.

On physical examination, she is fairly well nourished, her chest is retracted above and below the right clavicle, slight dullness, increased

fremitus, harsh breathing and a few inconstant clicks over the right upper lobe. Temperature 100.2° F., pulse 86, weight $98\frac{1}{2}$ lbs.; before she was ill, 110 lbs. No tubercle bacilli in the sputum. She was put on dietetic and hygienic treatment and attended the Middletown day camp. November 18th her weight had increased to 105 lbs. March 10th, 1909, she had a slight hemoptysis. August 19th was admitted to the Otisville Sanatorium where she remained for six months. She returned March 7th, 1910. No tubercle bacilli present in the sputum. Temperature 98.2° F., pulse 122, weight $111\frac{1}{2}$ lbs. April 13th, dullness, prolonged expiration over right upper lobe and left apex; numerous râles posteriorly; her cough is worse and her sputum is frequently blood-streaked. June 14th, temperature 99.2° F., pulse 104, weight $108\frac{1}{2}$ lbs. Her general condition is not so good. Tuberculin was given with an initial dose of 1/10 mgrm. continued twice a week and increased to 4 mgrm. September 9th, weight 110 lbs. She has had 56 injections in all. Her cough persists and the expectoration is at times streaked. Moderate dullness over the right upper lobe. There are no râles. Her signs are all less marked, her temperature is normal, but she has recently lost some weight.

Case VI.—Mary F., *aet.* five; family history negative as to tuberculosis. She was a bottle-fed child. Diphtheria at three years; measles at the age of four. She has had enlarged corvical glands since the age of three, and has coughed since she was nine months old, when she had a severe attack of pneumonia. After a "cold" last November, the glands below the clavicle were much swollen. One suppurated and required incision, and has discharged more or less ever since. Other glands have also increased in size.

She came under treatment March 22nd, 1910. She has lost flesh and strength, fever afternoons. Her appetite is good and bowels regular, weight 48 lbs. On physical examination, she is a pale, poorly-nourished child. Marked dullness, harsh bronchial breathing over both upper lobes. Numerous enlarged glands especially in the left side of the neck where there are three red, fluctuating areas below the angle of the jaw, the uppermost showing a badly-healed cicatrix of an incision made five months ago and which has continued to discharge a thin curdy pus. No tubercle bacilli present in the sputum. April 7th, von Pirquet tuberculin-test is positive. She was put on dietetic and hygienic treatment and has attended the day camp at Middletown regularly. On May 21st, a cold abscess on the left side of the neck was incised and a dram or more of pus evacuated. A rubber band has been worn constantly about the root of the neck, making a moderate pressure, with two hours intermission in the twenty-four, to try the Bier hyperemic treatment. March 26th, temperature 99.4° F., weight $47\frac{1}{2}$ lbs. Tuberculin treatment was begun with an initial injection of 1/5 mgrm. April 11th a second injection of 1/5 mgrm., April 14th, $\frac{1}{2}$ mgrm. The glands are somewhat smaller. Temperature 99.8° F., pulse 100, respiration 24, weight 49 lbs. She had

a considerable general reaction following the last tuberculin injection and on April 18th, the tuberculin was reduced to 1/5 mgrm. April 28th she had a suspicious looking sore throat with patches on the tonsils. A culture for Klebs-Löffler bacilli was negative. Tuberculin injection was omitted. May 11th, temperature 99.° F., pulse 116, respiration 26. She was given another injection 1/5 mgrm. on May 16th. Temperature 99.8° F. pulse 110; tuberculin 1/5 mgrm. Following the last two injections she has had a stitch reaction. June 10th, tubercle bacilli not present in the sputum. The tuberculin injections were continued in gradually increased doses twice a week to September 1st, maximum dosage 2½ mgrm. with a marked improvement in her neck and in her general condition. Glands are less swollen and less sensitive. The discharge has wholly ceased. The child seems well and in good spirits. On October 17th, when she was last seen the improvement had been maintained. There is no discharge, the sinuses which formerly existed are replaced by firm healthy cicatrices except at one point which is a trifle soft and tender. Cough is slight. Moderate dullness, increased breathing over both upper lobes, more marked over the right. Temperature 99½° F., pulse 90, weight 48¾ lbs.

Case VII.—Catherine C., *aet.* twelve, school girl. Family history negative as to tuberculosis. She has had measles and whooping-cough and an attack of pneumonia when five years old. Came under treatment December 27th, 1909. For three years she has had a winter cough which had been much worse for the past three weeks, muco-purulent sputa, fever afternoons, loss of flesh and strength, pain in the back, night sweats for a week; chills, dyspnea on exertion, appetite and digestion good, bowels regular. On physical examination, she is tall for her age but slight. She has a fair, white skin, flushed cheeks, arched eyebrows, long lashes, large lustrous eyes, and tapering fingers, a good example of the romantic type of tuberculosis. She has a well-marked funnel breast deformity. There are dullness, increased vocal fermitus, exaggerated whisper and breathing over the right upper lobe, and in the left axilla, and below the scapula and area of dullness and moist râles. Temperature 99.6° F., pulse 88, respiration 20, weight 88 lbs. No tubercle bacilli in sputum. December 30th, von Pirquet and Moro tuberculin-tests are negative. She was put on dietetic and hygienic treatment and attended the Middletown day camp. In March she began tuberculin treatment, receiving an initial dose of 1/10 mgrm. which has been gradually increased up to a maximum dose of 2 3/5 mgrm. Up to January 4th, 1911, she has had 43 in all, temperature, 98° F., pulse 100, weight 108½ lbs. There has been a decided improvement in her condition. Slight signs, dullness and increased breathing persist at the right apex, râles have entirely disappeared. She feels very well. Slight cough in the mornings, no expectoration.

Case VIII.—Joseph V., *aet.* thirty-five, employed in the Park De-

partment. Family history negative as to tuberculosis. Came under treatment March 22nd, 1910. Has had no serious illnesses except his present complaint which began with a cough in August, 1909; scanty purulent sputa. A week ago hemoptysis for the first time, loss of flesh and strength, night sweats, chills, fever, dyspnea on exertion, appetite and digestion are good. On physical examination, he is well nourished and has a good color. Dullness, broncho-vesicular breathing, increased whisper and fine râles over the right apex. Evening temperature 99° F., pulse 102, weight 180½ lbs., a year ago 200 lbs. Tubercle bacilli are present in the sputum. On March 31st, tuberculin treatment was instituted beginning with a dose of 1/10 mgrm. which was continued twice a week, increasing the dose up to 7½ mgrm. He received 23 injections in all up to June 14th, when the treatment was discontinued. There had been a marked improvement in all of his symptoms, râles disappearing, and he gained rapidly in weight. After the injection of June 3rd, he had a headache for two days and a little nausea. He had one stitch reaction. He was not seen during the summer, but on November 23rd his improvement had all been maintained. He has no cough or expectoration; his appetite and digestion are excellent, and he considers himself perfectly well. On physical examination, there is a little residual dullness over the right apex, no other signs. Evening temperature 98.6° F., pulse 100, weight 206 lbs.

An analysis of these cases shows that four, that is fifty per cent., have been apparently cured; one may be conservatively described as an arrested case, and each of the remaining three has been considerably improved. Every case has gained in weight, Case VIII. showing the extraordinary increase of 25½ lbs.; Case IV. 9½ lbs. In three, bacilli have disappeared from the sputum. In one case in which tubercle bacilli were present in the sputum before beginning treatment, no sputum could be obtained for examination after the tuberculin injections were discontinued. The remaining four cases from the beginning were closed cases, no bacilli at any time having been found. In cases in which fever was present, the temperature has uniformly fallen under the tuberculin treatment. Four of the patients treated had frequent hemoptysis or considerable hemorrhages, and this symptom has been favorably influenced under tuberculin, hemoptysis having ceased entirely in three cases where it was present.

In several instances, notably Cases I. and VIII., improvement continued after the cessation of the specific treatment which appeared to give the patient the necessary impetus to recovery and sustained resistance to his disease.

As far as conclusions may be drawn from this series of cases, it would seem that it is not necessary to limit the use of tuberculin to sanatorium and hospital patients, but it may be safely employed for any incipient or moderately advanced case with sufficient intelligence to keep his tem-

perature chart, and enough imbued with a desire to get well to continue his treatment over an adequate period of time. An elevation of temperature of a degree or a degree and a half is not necessarily a contra-indication to the tuberculin treatment. With the observance of simple precautions, carefully graduated doses, avoidance of reactions, and a proper selection of cases, there seems to be no good reason why tuberculin should not be much more extensively used in practice. No other method of treatment known will accomplish the results which may confidently be expected from tuberculin in many cases of pulmonary tuberculosis.

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HEAT AFFECTIONS.

By CLEVELAND H. SHUTT, M. D., of St. Louis.

Heat affections are usually serious and require prompt treatment. They are divided into two classes:—Heat exhaustion and heat-stroke (thermic fever or sunstroke). They may be associated with other conditions and especially with suffocation. Firemen frequently suffer from the combined influences of heat and gases.

Heat exhaustion is an asthenic condition characterized by a subnormal temperature, general weakness, and frequently by severe collapse. The initial symptoms are severe headache, changes in vision, and a general feeling of exhaustion.

Heat-stroke is a sthenic condition characterized by prodromal symptoms usually of short duration. They may be headache of an intense type, changes of vision and a general overheated and oppressed feeling. There is always a rise in temperature. The mild forms are known as thermic fever and the severe forms as insolation cases. In insolation cases the patients are semiconscious or unconscious, and their temperature frequently reaches 108° F. and may reach 112° F.

The majority of heat-stroke cases occur during the very warm months, in those directly exposed to the rays of the sun. Cases also occur in those exposed to high temperatures in laundries, boiler-rooms, etc. A hot, moist atmosphere impedes evaporation and is more dangerous than dry heat. Alcoholics are more susceptible to heat affections than temperate persons, and have less chances for recovery.

Horatio C. Wood, who has made exhaustive researches, concludes in regard to the pathological physiology of heat exhaustion and heat-stroke as follows:—"There is in the pons or higher portion of the nervous system a centre, whose function it is to inhibit the production of animal heat, and in the medulla oblongata a centre (probably the vasomotor centre) which regulates the dissipation of bodily heat. Fever is due to a disturbance of these centres so that more heat is produced than normal and proportionally less thrown off. Let it be supposed that a man is placed in such an atmosphere that he is unable to get rid of the heat which he is forming. The temperature of the body will slowly rise, and he may suffer from a general thermic fever. If early or late in this condition the inhibitory centre becomes exhausted by the effort which it is making to control the formation of heat, or becomes paralyzed by the direct action of the excessive temperature already reached, then suddenly all tissues will begin to form heat with the utmost rapidity, the

bodily temperature rises with a bound, and the man drops over with one of the forms of heat-stroke.

"Heat exhaustion, on the other hand, with the lowered temperature represents a vasomotor palsy, *i. e.*, a condition in which the existence of the heat paralyzes the centre in the medulla and the heat is dissipated more rapidly than it is produced."

The explanation for heat exhaustion is considered by authorities as less satisfactory than it is for heat-stroke. The symptoms of heat exhaustion and heat-stroke are widely different. However, first appearances may cause some question as to diagnosis. The thermometer is a valuable aid and its findings usually decide the diagnosis between the two forms of heat affection.

One should fix certain points in diagnosis clearly in mind; otherwise a lack of history, so frequently the case in hospital or dispensary service, may delay diagnosis and treatment. Heat exhaustion presents a feeble, weakened condition or a state of collapse, and a lowered body temperature. The temperature may range from slightly below normal to 94° F. or lower. It usually occurs in old people or in those whose resistance is below normal. Heat-stroke, on the contrary, usually occurs in the active able-bodied, and presents a rise of temperature. Both affections in the severe forms present semiconscious or unconscious conditions.

A feeling of extreme heat and oppression usually precedes a heat-stroke, and unconsciousness may supervene rapidly. Death may occur in a short time. In many cases there is an intense headache, oppression, vertigo and sometimes nausea. The pulse and pupils are not characteristic, varying with the temperature. The skin is usually dry, but some perspiration may be present.

To make a differential diagnosis of cases without history may require some time, but there need be no delay in trying to reduce the temperature. Laboratory and other examinations and observations may be made at the same time. The urine should be examined early, and blood examinations are frequently useful and necessary.

Usually the patients are found in a semiconscious or unconscious condition, and a number of possible conditions must be considered and excluded. Where a history is obtainable, the diagnosis is usually plain. One should be able to make a diagnosis in the more severe or unconscious forms without a history. The following table for the differentiation of unconscious cases, without a history, may be of some advantage.

TREATMENT.

Cases of heat prostration require treatment suitable to an asthenic condition, *i. e.*, conservation and building-up of energy. The patients should be placed in warm beds, and hot stimulating drinks should be given. Articles which retain heat for some time should be wrapped in

DIFFERENTIAL DIAGNOSIS OF UNCONSCIOUS CASES WITHOUT A HISTORY.

	PULSE.	TEMP.	RESP.	NERVOUS SYSTEM	MUSCULAR SYSTEM	CHANGES IN SPECIAL ORGANS, ETC.
Heat Exhaustion	Usually weak and rapid	$\frac{1}{2}^{\circ}$ — 4° F. below normal	Shallow or about normal	Semi or unconscious. Extreme weakness. Asthenia—collapse	Flaccid, quiet	May have changes in vision and headache as initial signs. Cold extremities, skin pale
Heat - stroke (sunstroke, thermic fever, etc. Insolation cases).	Frequent usually full and tense	Above normal. May reach 110° F. or more	Usually active and may be labored	Sthenic condition. Active—usually	Resistive. Tense. Tendency to be active. Strength good	<i>Involuntary defecation</i> occurs frequently. Skin usually dry. May or may not have alcoholic odor
Acute Alcoholism	Usually full and rapid	May be subnormal, normal or increased	Frequently stertorous	Collapse in extreme cases. Can usually be aroused	Usually tense. In severe cases flaccid	Breath odor—general appearance—cyanosis in extreme cases with flaccidity. Stomach contents.
Delirium tremens (severe)	Rapid—variable in strength	Above normal, may be high	Variable	Hallucinations, delusions, etc. Can usually be aroused for a moment	Weak—signs of illness for several days	May or may not have alcoholic odor—usually not. General unkempt appearance and evidence of disease of some duration.
Febrile delirium (typhoid, pneumonia, etc.)	Variable	Always above normal. Bathing will not lower to subnormal	Variable	Variable delirium. Substultus tendinum tremors, etc. Carphologia	Feebly active. Signs of extended illness	Accumulations around teeth and tongue and eyes. Laboratory examination of body fluid. Skin and other physical findings
Cranial lesions (injuries, etc.)—under 24 hours—injury to base of skull, etc.	Full or shallow. Reg. or irreg. May be much decreased in rapidity, about normal or rapid	May be slightly subnormal, usually more or less above normal	Variable	Semi- or unconscious. Quiet or delirious. Basal injuries usually produce active delirium or deep unconscious condition. Reflex changes	May be relaxed. May have local spasm or paralysis or general activity. Usually the body appears well nourished	Usually have some evidence of local head injury—wound, hematoma, ecchymosis or bleeding from ear, nose or mouth. These findings may be entirely absent. Reflexes very important. Finding of blood in not more than 1-2 c.c. of spinal fluid. Examination of urine, etc. Pupils.

	PULSE	TEMP.	RESP.	NERVOUS SYSTEM	MUSCULAR SYSTEM	CHANGES IN SPECIAL ORGANS, ETC.
Cranial conditions (over 24 hrs.)	Variable	Usually above normal	Variable	Semi- or unconscious. May be delirious or quiet. Reflex changes	May be relaxed or have local spasm or paralysis. Body may show signs of period of illness	Above findings apply. Reflexes very important. Entire body to be examined for injuries in all cases. Pupils
Apoplexy	Usually full and slow. May be thready and rapid	Frequently normal — may be above and rarely below	Variable frequently stertorous	Semi- or unconscious. Changed reflexes may be quiet or restless	Local spasm or paralysis. General condition usually good	Age of patient and condition of vessels—pupils—may have secondary head injuries. May have odor of alcohol
Uremia	Usually full and tense and rapid	Somewhat above normal	Frequently deep. May find acetone odor on breath	Semi- or unconscious. Sometimes may be aroused	Feebly active or passive. Nutrition usually appears good	Breath odor. Enemas may or may not be present. Examination of urine
Poisoning	Variable	May be subnormal, normal or elevated	Variable	Seldom delirious. Reflexes usually present	May be flaccid or spasmodically active	Traces on skin or mucous membranes. Findings on clothing and in pockets. Odors on breath. Frequent cyanosis
Comatose malaria	Usually rapid and shallow	Usually above 105° F.	Variable	Semi- or unconscious. May have some delusions	Usually passive	Blood examination—spleen—prevalence of malaria. Temperature not much reduced by bathing
Status Epilepticus	Usually rapid	Above normal usually	Variable	Reflexes variable at various stages of spasms	Frequent or almost continuous spasms. Well nourished	Frequent spasm. Cyanosis, changing rapidly
Hysteria	About normal, may be increased	About normal	Variable	Reflexes about normal, usually slightly semiconscious	Relaxed, normal or spastic	Sudden mental or mechanical stimulation usually causes patient to change attitude and make diagnosis plain

flannel and placed along the extremities; hot blankets should also be thrown over the patient. Hot milk, hot egg-nog, bouillons, coffee, etc. are useful. In severe cases, hypodermic stimulation may be necessary: digitalin, strychnine, camphorated oil, or aromatic spirits of ammonia, 10-20 min. well diluted with Sp. Frumenti, may be used. Such stimulation should be used moderately, and as in many other conditions may be overdone. Cooling applications to the head and hands, moderately applied, may have a refreshing effect.

The treatment for heat-stroke cases is such that doubtful cases may be treated for some time without serious injury. When there is doubt, careful observation and frequent physical and other examinations are necessary.

A reduction of body temperature is the first object, and is attained by using means to establish the greatest amount of radiation and absorption of heat from the body. An insolation case will require the constant attention of a physician and one or more attendants for several hours, and should be observed for several days after the temperature remains below 100° F.

The patient may be placed in a bath-tub with enough cold water nearly to cover the body. Two or three persons are required to handle a severe case: one keeps the patient from struggling out of the tub or getting his head under water; another gives vigorous friction-rubs and adjusts the temperature of the water. The physician watches changes in temperature (a thermometer should be constantly used per rectum), in pulse, respiration and general condition; and directs the handling of the patient, the length of time in bath, amount of stimulation, when the change from bath to bed should be made, etc.

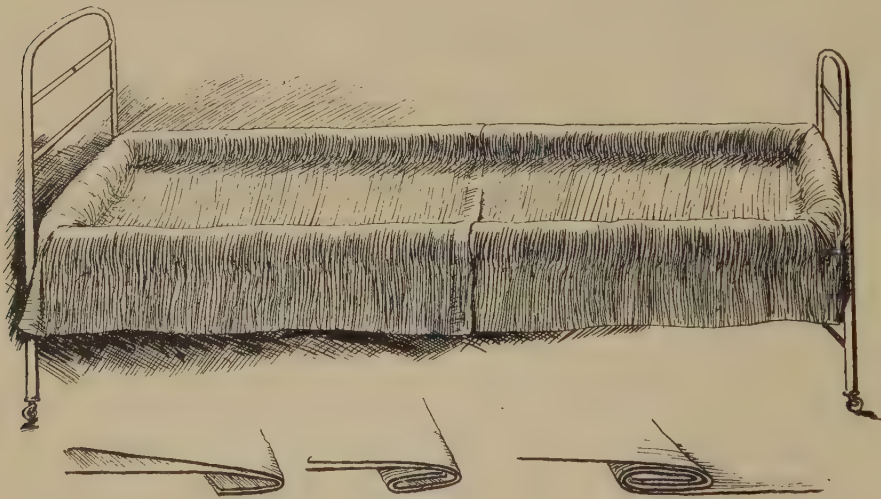
After the patient is placed in water, vigorous rubbing is begun, and ice coarsely cracked is gradually added. The thermometer should be inspected every minute or two. The initial temperature may have been 110° F., and under active treatment it may drop to 94° F. in ten to twenty minutes. When the temperature begins to fall, several degrees may be lost in a few minutes. As soon as the mercury begins declining rapidly, the patient should be placed in a warm bed before it reaches normal. It will drop for several minutes after warmth is applied. Stimulation is used according to the pulse and general condition. The tendency is to use too much hypodermic stimulation. After treatment in bed for a short time, there will be a rapid rise in temperature, and before the patient can be placed in the tub again, the thermometer may register 105° F., or more. Treatment is again instituted to reduce the temperature, and when nearly normal the patient is again placed in bed.

The above-mentioned procedures should be carried out gently. It may require several hours of constant, active treatment before the temperature will assume a non-fluctuating character and remain within safe range.

The marked and rapid fluctuation in heat-stroke cases under active

treatment will assist in distinguishing them from other diseases. As occasion may demand, blood and other special examinations may be made. The urine should be examined early in all cases. A typhoid or other temperature may be reduced to nearly normal by vigorous treatment, but subnormal temperatures are not commonly obtained. I have not observed such a phenomenon, but can conceive of the possibility in weak and exhausted cases. The difficulty of arriving at a diagnosis in such cases occurs more frequently when patients speak only a foreign language.

The treatment during convalescence should be constructive and symptomatic. Frequently it is advisable to recommend a change of occupation or position, since there is less resistance to heat affections after the first attack.



Illustrating a bed prepared for treatment of heat cases—also manner of folding water-proof covers so as to obtain an impermeable joint.

Quite often firemen and others are overcome by the effects of heat and gases. In these instances, the diagnosis is plain from the surroundings, history and condition of the patients. They may or may not be unconscious and there may be no gaseous odor of diagnostic value. Such cases should be treated by combined methods. Stimulation may or may not be required, the pulse being the guide. Cooling applications will be more or less necessary according to the degree of heat affection. If suffocation be the most marked condition, judging from a low temperature, and associated with unconsciousness, etc., the patient should be placed in bed near a window or in the open. The foot of the bed may be elevated and moderate injections of camphorated oil or other respiratory stimulants be given. The above methods may be combined according to the degree of suffocation or heat affection.

Water and ice applications are the best and most convenient mediums for reducing high temperatures. Bath-tubs are not always obtainable and are usually against a wall. It is very convenient to be able to work with the patient from both sides. It has been found that an ordinary bed can be arranged to take the place of a bath-tub, and may afford some advantages. Two or three boards should be placed across the bed under the mattress to prevent sagging. If the bed has a woven wire mattress, the top mattress may be removed. Two firm rolls, six to eight inches thick, are made quickly by rolling blankets, carpets or other material, and then placed lengthwise and about two feet apart on the bed. (See diagram.) Short rolls of pillows or other material is used for the ends. The corners are pinned to prevent spreading. If a full-length rubber-sheet is obtainable, it is placed over the rolls and the improvised tub is ready for use. If such a sheet is not obtainable, two pieces of oil-cloth may be joined as represented in diagram. An impermeable joint is thus formed. The edges of the sheet may be tucked under the rolls.

A bed so arranged has several advantages. It can be made up on short notice and may be placed so that attendants may work from all sides. Three to five gallons of water are sufficient. Ice may be used to advantage, but is not entirely necessary. A thin cloth is placed over the patient and is kept constantly moist. Constant fanning produces rapid evaporation and the temperature is quickly reduced. When the temperature starts down, the water may be let out at one corner of the bed and dry blankets and warmth applied. This plan has been used in very severe cases, and it has been found unnecessary to move the patient during the treatment.

Metropolitan Building.

GENESIS OF INCIPIENT PULMONARY TUBERCULOSIS.

By EDWARD VON ADELUNG, M. D., of Oakland, Cal.

It was some years, after Koch demonstrated the tubercle bacillus, before the majority of physicians realized the possibility of diagnosing pulmonary tuberculosis without finding the bacillus in the sputum. During that interval it was clearly a bold step to tell a patient positively that he was tubercular without having seen the bacillus. And it was considered evidence of diagnostic acumen to be able to demonstrate the presence of tubercular disease by ordinary physical examination alone, *i. e.*, in the prebacillary stage. But attention was then drawn to the importance of physical signs and there followed a period during which gross signs of consolidation and râles were required as the proper basis for positive diagnosis in the absence of the bacillus. The fatal tardiness of these diagnoses was rendered evident by the history of the patient, which showed convincingly that the disease was not being diagnosed early enough. Too large a proportion of the patients died, and pathologists found no difficulty in demonstrating that the destructive process was well advanced before clinical changes were noted. Closer study was therefore devoted to the physical signs of the disease, and such great progress was made that to-day structural changes of surprisingly small extent are detected by trained diagnosticians. Indeed, so keen are some diagnosticians that at times one is inclined to fear that they are self-deceived, and that perhaps a discount of their findings should be made. But even accepting the keenest work at its face value, it must be admitted that the end-results still throw back the same reply,—“too late.” So that even the nicest pulmonary inspection, the most exact mensuration, the most sensitive palpation, or the most delicate percussion here fails to prove of great service. Denied these aids, we have clung to auscultation which alone holds its high place as a means of early diagnosis. But we find that even its value is closely circumscribed. Its service depends not on râles, once regarded as sufficient, nor on bronchial breathing, once considered even more indicative, nor perhaps even on harsh breathing which is still regarded by some as the earliest sign. The auscultatory information now accepted as of value relates to still finer alterations of breathing sounds; so fine, indeed, that they are described only with much difficulty.

The art of auscultation in early tuberculosis has clearly progressed far. Yet, to our dismay, the loss of our patients continues to tantalize us with ever the same criticism, “too late.” Inspection, mensuration,

palpation, percussion, auscultation,—all these means, though keenly applied, still fail to diagnose pulmonary tuberculosis sufficiently early. Discouraged, we ask whether we are not attempting the impossible. Have Auenbrugger and Laënnec actually failed us? We shall see.

The last twenty years have witnessed persistent, progressive attempts to detect tubercular infection of the lungs at the earliest possible moment. We have seen the disease classified first into early and advanced stages; then into incipient, early, and advanced stages; then into latent, incipient, early and advanced stages; and finally into pulmonary, latent, incipient, early and advanced stages. So that we now discover pulmonary tuberculosis before it arrives, as it were.

Criticism falls rather severely on the physician who fails to diagnose a case of advanced pulmonary tuberculosis; yet that happens to-day, not infrequently. We would look askance at one who failed to recognize an early case; yet that occurs quite commonly. We are rather sure that the average physician should be able to discover incipient tubercles in the lungs; yet contrary to the prevalent impression, that is a rare deed. When it comes to the latest diagnostic feat, the detection of the *prepulmonary* stage, we are quite tolerant of error.

There are good reasons for all this: dependable percussion and auscultation are acquired only by years of careful training, and unfortunately their results are very difficult of interpretation. This is partly due to the variability of normal findings, which, as a matter of fact, are not yet fully defined.

The anatomy of the chest, with the variety of tissues, the unsymmetrical arrangement of air-tubes and blood-tubes, the eccentric heart, the bilobar left and the trilobar right lung, and the frequent malalignment of the spine, suggest, *a priori*, that symmetrical points on a normal chest would not yield identical physical signs. In practice we compare symmetrical areas not expecting them to yield the same waves, but studying rather the degrees of difference between them to determine whether they are within normal limits. The prominence of vocal fremitus over the right chest, the dullness of the right apex, the harsher breathing sounds over the right upper lobe are among the commonly recognized differences between the two sides normally. Knopf points out that no two spots on the normal chest give the same voice conduction. Cabot only recently discovered that the normal chest often shows louder and harsher breathing sounds over the left base; and this independently of age, sex, time of day, or food. And furthermore, this finding is sometimes permanent, and sometimes temporary; or it may change from one side to the other. Hence the remark that the physical findings are often difficult to interpret. Sometimes it seems remarkable that we are able to infer as much as we do from physical examination.

While we commonly associate dullness with tubercles, it has been shown that hyper-resonance sometimes results, thus misleading even the best diagnosticians to indicate the wrong apex as the location of disease.

It is interesting to note the variance among authorities regarding the earliest signs of pulmonary tuberculosis. For instance one states that "comparatively slight importance attaches to inspection, palpation, or percussion, in very early cases. It can be assumed that whenever appreciable deviations from the normal are recognized upon inspection, palpation, and percussion, the infection has been of sufficient duration to preclude its classification under the head of incipency. True incipient cases are recognized almost solely through recourse to auscultation. The prominent auscultatory signs, as a rule, do not relate to changes in pitch, quality, rhythm, or intensity of the respiratory sounds, but consist of fine crackling râles heard chiefly at the end of inspiration following a cough."* In contrast with this statement we have another recognized authority declaring that "râles cannot justly be considered as signs of incipency."** One of our best observers fixes on "a rough vesicular respiration, *respiration rude et grave* of French authors, *rauhes Athmen* of German writers," not to be "confounded with harsh, sharp, or puerile respiration with which it had nothing to do." It is defined as follows: "The respiratory murmur is rough and low-pitched, and is made up of a succession of very short sounds, as though small, soft granules of fine, wet sago were being rolled over each other." The difficulty of description is indicated by the fact that the author quoted devotes over a page to the attempt. However, we see that auscultation yields the first physical sign, and that this sign is a rough vesicular respiration. We have scarcely fixed this point when we are immediately warned that exactly the reverse may occur; we must not forget that the opposite of rough breathing, viz., feeble breathing, may be the first sign.

And likewise confidence in the diaphragmatic excursion sign, as observed by Litten's method or by the fluorescent screen, is somewhat shaken when one learns that "slight deviation of the normal descent of the diaphragm is more a matter of clinical interest than of diagnostic value in early tuberculosis. A pulmonary change sufficient to retard the diaphragm is already easily recognized otherwise."

At this point one should recollect that there is a clear difference between what are the earliest signs of pulmonary tuberculosis in an academic sense, and what are the earliest signs in a practical sense. Hair-splitting discussions are profitably avoided.

Under favorable circumstances one can doubtless demonstrate such fine differences in physical signs as those above referred to. But I agree heartily with Minor that "since few patients are seen in the very incipency, harsh respiration, especially in the expiratory phase, will be the change ordinarily found in the majority of incipients," and also with Bonney, that in many cases fine râles are the first sign. It is a regrettable

*Bonney: Pulmonary Tuberculosis.

**Minor: Klebs' Tuberculosis.

matter of common experience that subjects of incipient tuberculosis rarely feel sick enough to consult a doctor; and it is also a regrettable fact that when they do consult a doctor the chances are vastly in favor of the disease being overlooked. It was stated above that not only early cases, but moderately advanced cases, and occasionally well-advanced cases are passed unrecognized by not a few general practitioners; and while this is partly explained by the difficulty of eliciting and interpreting physical signs, it is certainly often due to the absence of marked physical signs such as râles and dullness. However, such cases would never be missed if the examiner required a radiograph in doubtful cases. This method of diagnosis of both advanced and early stages is so important that it may be stated almost dogmatically *that in the presence of unexplained constitutional symptoms such as marked loss of weight, weakness, reduced endurance, or continued impairment of appetite, one should never deny the presence of thoracic tuberculosis unless a negative radiogram has been obtained.* The value of the x-ray in thoracic work is equivalent to urinalysis in abdominal work.

Thus Roentgen comes as an indispensable reinforcement to Auenbrugger and Laënnec. By their combined methods we are enabled to do very good work, and we are about to flatter ourselves that at last we have succeeded in detecting incipient tuberculosis when we are again met by the repulse of end-results,—too many patients die,—and pathology again says “too late.” So we put detectives on the trail of the invisible enemy and learn that his line of invasion is usually by the digestive tube, through whose walls he readily passes leaving no trace behind him, and then locates in the mesenteric glands, or travels by the thoracic duct and bloodstream to the mediastinal or bronchial lymphatic nodes. It is here where he must be detected if we are able to diagnose real incipency, if we are to recognize the prepulmonary stage, if we are to avoid the biting criticism, “too late.” Especially does this conception of incipency apply to children where the incident of glandular tuberculosis prevails over pulmonary.

Mediastinal or peribronchial infection is difficult to detect by physical signs. Aside from the general or constitutional symptoms one relies almost entirely on Petruschky's sign which consists of tenderness over the upper thoracic spines (spinalgia), often confined to the region of the fifth thoracic spine, combined with dullness in the same region. In advanced cases pressure symptoms may occur: stridulous breathing, cough, etc., sometimes accompanied by dullness over the manubrium. In all cases important information may be obtained from the radiogram, the value of which is steadily growing as its technique and interpretation are better understood. When these means of investigation yield a definite positive answer, and when confirmed by the tuberculin tests and the constitutional symptoms, diagnosis of prepulmonary tuberculosis is possible. Whether end results shall again deny the laurels of success, is yet to be learned.

Thus we have witnessed that our most modern conception of incipency passes through many transformations: from prebacillary to early, incipient, latent, and, finally, prepulmonary recognition. While we must not lose sight of the highest ideal, which demands diagnosis of *pathologic* incipency,—an avowedly difficult task,—there is another ideal far easier of attainment by the average practitioner, on which I am inclined to place emphasis. This realizable ideal is the detection of the disease before large pulmonary areas are involved,—a thoroughly practical idea, to be attained by simply exercising more care in employing the ordinary standard methods of examination. But as long as many physicians examine the chest without removing the clothing from the thorax, as long as many fail to require the patient to cough during auscultation, as long as negative diagnoses are made without a temperature record, or adequate sputum examination, and especially without a radiogram, no apology need be offered for missionary efforts looking toward improvement in the recognition of early tuberculosis.

MEDICAL AND SURGICAL PROGRESS.

ORTHODIAGRAM OF THE HEART.

A REVIEW OF RECENT LITERATURE.

By E. H. SKINNER, M. D., of Kansas City.

1. Achelis: Regarding the Orthodiagraphic Demonstration of the Apex of the Heart. (*Munch. med. Wochenschr.*, No. 43, 1910.)
2. Beck: Orthodiagraphic Examinations of the Size of the Heart in Tuberculosis Pulmonalis. (*Deutsch. Archiv. fuer klin. Medizin*, Bd. C., Heft 5.)
3. Block: Normal Negatives of the Heart and Their Clinical Significance. (*Deutsch. med. Wochenschr.*, No. 36, p. 1656, 1910.)
4. Claytor and Merrill: Orthodiagraphy in Pathological Conditions of the Heart and Aorta. (*Amer. Journ. Med. Sciences*, No. 4, Vol. CXL.)
5. Francke: Die Orthodiagraphie. Monograph. J. F. Lehmann, Munich, 1906.
6. Franze: Orthodiagraphische Praxis. Monograph. Otto Nemnich, Leipzig, 1906.
7. Groedel: Die Orthoroentgenographie. J. F. Lehmann, Munich, 1908.
Roentgendiagnostik in der inneren Medizin. J. F. Lehmann, Munich, 1909.
8. Hirschfelder: Diseases of the Heart and Aorta. J. B. Lippincott Co. 1910.
9. Kœhler: Teleroentgenography of the Heart. Roentgentaschenbuch. Band II. Otto Nemnich, Leipzig, 1910.
10. Mackenzie: The Oliver-Sharpey Lectures upon Heart Failure. (*Lancet*, No. 4571, Vol. CLXXX., and following.)
11. Mohr: Demonstration of the Radiological Diagnosis of Adipositas Pericardii. (*Munch. med. Wochenschr.*, No. 10, p. 543, 1910.)
12. Osterroth: Displacement of the Lungs Dependent upon Congenital Defects. (*Deutsch. Militar. Zeitschr.*, Heft II., 1910.)
13. Schwarz: Upon a Typical X-Ray Finding in Hearts of Obese Individuals and its Anatomical Foundation. (*Wiener klin. Rundschau*, No. 51, 1910.)
14. Vasquez and Bordet: Concerning the Comparative Value of the Orthodiagraph and Percussion in Mitral Stenosis. (*La Semaine Médicale*, p. 217, 1909.)

15. Van Zwaluwenburg and Warren: Diagnostic Value of the Orthodiagram in Heart Disease. (*Archives of Internal Medicine*, No. 2, Vol. 7, 1911.)

The superiority and advantage of heart outlines obtained by the x -ray over the outlines as secured by percussion seems to be no longer in question. By percussion we are obliged to distinguish a relative dulness of the left border of the heart and a dulness upon the right side which is obscured by the sternum. The use of the parallel x -ray in modern orthodiagraphic apparatus gives us practically the absolute outlines of the heart and the shadows of the pericardium, when the latter has undergone pathological changes with cast shadows.

The orthodiagram obtained by parallel rays must not be confused with a skiagraph made from a single focus point. The orthodiagram is more easily interpreted than the ordinary x -ray negative, all that is necessary being a simple knowledge of anatomical topography. Another advantage is the rapidity with which an orthodiagram can be obtained and the expense required for the x -ray negative is avoided.

In modern orthodiagraphic apparatus there is no danger to the patient or the operator, as the tube is covered by an x -ray proof shield, and only a small pencil of parallel rays is allowed to penetrate the opening in the lead diaphragm which is about 2 cm. in diameter. This pencil of x -rays is thrown upon a fluorescent screen, which is in turn covered by a lead-glass plate for protecting the eyes and face of the x -ray operator while conducting the procedure. The operator should also wear heavy leather or x -ray-proof gloves.

Orthodiagraphy is a valuable adjunct to the ordinary physical examination of the heart and mediastinal vessels, of which it is capable of making fairly accurate outlines, as well as measurements which can be compared with the normal and also with subsequent orthodiagrams of the same patient. Köehler has advocated teleroentgenographs or negatives taken of the heart with the tube at least two metres distant from the patient and with the x -ray plate upon the chest anteriorly. He claims that with the source of the x -ray being at this great distance, there is very little increase in the size of the shadow over the actual size of the heart, and, further, that this slight error is not any greater than the error which can be attributed to the unsteadiness or to the visual error of the operator making the orthodiagraph. Constant practice diminishes the possibility of error in orthodiagraphy. But it is true that the expense of teleroentgenographic apparatus is less than orthodiagraphic. A poor technique in orthodiagraphy should be discarded in favor of teleroentgenograms.

The study of the moving heart with its pulsations in the various chambers, and of the great vessels, by means of the fluoroscope, and the outline of the exact heart mass by orthodiagraphy is receiving an increasing amount of support. We have been studying the heart sounds and their significance, just as we have been paying so much attention to the careful chemical analysis of the stomach contents. We now find that much valuable information, in fact, far more important information can be obtained from the study of the gastric motility; and there is every reason to believe that the study of cardiac motility will yield increasing diagnostic assistance, beyond percussion and auscultation.

Mackenzie in the recent Oliver-Sharpey lectures fails to justify our time-honored notions regarding the diagnostic significance of the various valvular sounds, and takes issue with all our preconceived ideas about

heart failure and compensation. He places great stress upon the study of auricular fibrillation. As this affects the motility of the auricles, it may be presumed that the fluoroscopic examination will offer assistance in this connection.

Up to the present time the orthodiagraph has been used mostly in determining heart outlines and classing them with the various lesions now recognized by certain valvular sounds and changes in mass outline. But it would seem that the studies in heart diagnosis by means of the x -ray had about reached the point that stomach radiology reached some years ago, before the importance of the study of the gastric motility was emphasized. We are familiar with the orthodiagraphic outlines of the heart as produced by various valvular defects or changes in the muscular walls. But this is the diagnosis of terminal pathological changes and not the study of the incipient stages. It is in the study of the motility of the heart, just as in the stomach, that the earliest diagnostic symptoms will be found.

The recent article of Claytor and Merrill does not offer any peculiar information that has not been published several years ago by various European radiologists, but it is pleasing to note that at least in a few American centres the use of the fluoroscope and the orthodiagraph is receiving justifiable attention. America seems to be on the verge of giving more attention to this method of x -ray diagnosis, which for many years has been *obscured* either by an indifference or fear among American physicians and radiologists.

Claytor and Merrill discuss orthodiagraphy under headings, entitled Accuracy of Results—Practical Value of Orthodiagraphy and Possibilities of Error—Aneurysm of the Thoracic Aorta—Valvular Lesions. Then follows a series of classical illustrations with descriptions. They feel that the orthodiagraph is of real value to the clinician, and that as it becomes more commonly used we may be able to formulate useful facts which as yet it is unwise to attempt. While they do not feel that its use is demanded in all cases or is even necessary, it may still be of great aid in many of the more or less obscure pathological conditions of the heart and aorta.

Van Zwaluwenburg and Warren have likewise offered in the English language and before an American audience the results of their studies upon the index of the cardiac area in comparison with the body weight. There is little new in this article beyond the previously published monographs of some years ago by Franze, Francke and Gröedel. They have, however, with scientific care and accuracy, studied the dimensions of 60 orthodiagrams which are classified according to diseases. They feel justified in the conclusion that "an abnormal dimension index is an early evidence of the increase in size of one or more chambers of the heart and may occur before such an increase can be demonstrated by other means; that a decrease in the index results from left ventricular hypertrophy and dilatation, and that an increase indicates a dilatation of the auricles with or without hypertrophy of the right ventricle. In combinations of these two antagonistic factors the index will depend on the predominance of the one or the other. The wide variation shown in valvular diseases should make the index valuable in the diagnosis of doubtful or combined lesions, and it is hoped that the smaller fluctuations found associated with renal conditions may sometimes be of diagnostic and prognostic value." Their method of obtaining the cardiac index is ingenious and worthy of attention, but is too technical for the purposes of this review.

Hirschfelder, in his recent textbook, offers a few pages upon this subject, which, while elementary in technique, are worthy of attention because of the conclusions. Hirschfelder says that it is possible by means of the fluoroscope to watch the individual contractions of the heart and note the changes in the size due to systole and diastole, although this is very difficult. But he thinks that the contraction of the auricles can be seen with considerable definiteness, and dissociation of the rhythm of heart-block can often be diagnosed in this way by simple inspection.

Aside from the orthodiagraphic information regarding the dilatations of the various chambers of the heart, this method lends valuable assistance in determining changes in position and form of the heart in congenital and acquired alterations in the thoracic anatomy, which may be only suspected by ordinary physical examinations. Osterroth reports the case of a recruit, previously healthy, who entered the hospital after his first jumping exercises. The physical examination revealed, upon the posterior lower left lung area, a dullness with bronchial breathing. No fever. In the heart area there were full resonance and vesicular breathing. Heart dullness was to be found in the posterior thoracic wall under the angle of the scapula, and the apex-beat was determined in the seventh intercostal space in the posterior axillary line. By the anteroposterior orthodiagram, a wide change of heart shadow to the left, which located the heart entirely in the left half of the thorax, not even reaching the spinal column in the middle. The oblique upper border of the heart shadow showed pulsation. It, therefore, appeared that a portion of the left lung, apparently the inferior lobe, was very small following a congenital atelectasis, and that the high degree of change in the heart area to the left and posterior had ensued.

Concerning the comparative value of the orthodiagraph and percussion in mitral stenosis, Vasquez and Bordet report that while in the anteroposterior position the normal orthodiagram shows a more or less small distinguishable arch of the left heart shadow, that in distinct mitral stenosis the form of the left heart line is nearly vertical. The usual arch, which in the normal condition is the left ventricle of the heart, is failing. More important is the condition of the shadow of the left auricular appendage, which is markedly enlarged by an outward curve extending backward frequently to the spinal column. Not infrequently in the oblique position, the shadow of this appendage obscures the normal interval between the heart and the spinal column.

Both Schwarz and Mohr report upon the typical changes in orthodiagraphic outlines of fatty hearts. Schwarz has been able to determine the deposition of the fatty layer by the filling out of the usual angle between the heart apex and the diaphragm. In post-mortem examinations, some of these cases showed small fatty deposits measuring 2.5 to 3 cm. in thickness. By the use of the very soft tube, these appear to be small dark shadows which can be recognized apart from the shadow of the heart itself. Aside from the use of the soft tube, Schwarz cautions one to make the orthodiagram during deep inspiration, as the high position of the diaphragm can cover up the entire phenomena.

Mohr's article is a repetition of Schwarz's findings, but he also adds that in the oblique diameter one sees these contracting masses of fat upon the heart contour. By the fluoroscopic examination one sees, in contradistinction to the usual movement of the heart action, that these lateral cloudy masses do not move and are also uninfluenced by the diaphragmatic movements; while if there are pericardial adhesions or

pleuritic adhesions these shadows do move. Mohr refers to deposit of fatty masses upon the pericardium in these fluoroscopic symptoms.

Since it is difficult to obtain a good shadow of the apex of the heart under the usual methods, Achelis has suggested the inflation of the stomach with carbonic-acid gas to make the apex more apparent. The best degree of transparency is secured by moderate inflation. His method consists in offering the patient, who has come in a fasting condition, about 4 gm. of tartaric acid dissolved in a half-glass of water and then a wafer containing about 2 gm. of powdered bicarbonate of soda. Usually the heart is displaced upwards a slight degree and towards the left, assuming a transverse position. By this procedure, however, the heart mass itself does not undergo any change, although there may be pathological changes in the outlines of the heart mass as regards the position, form and shape of the different parts of the heart shadow.

Beck discusses the size of the heart in pulmonary tuberculosis. He finds that the size of the heart in tuberculosis can be influenced by different diseases; for instance, by nephritis, valvular defects, and congenital cardiac weakness. In 30 cases of pulmonary tuberculosis all of these conditions were eliminated, and it was ascertained that there was a lessening in the heart volume in tuberculosis, when compared with the relative normal size and weight of body.

Block presents a method of measuring the heart shadow by always applying the focus of the x -ray tube to one point upon the chest and then erecting a system of charts in which the study of such shadows will be indicative of the various changes in outline produced by different pathological changes, although these may be distorted shadows. While not giving the true size of the heart, yet, by comparison with a constant or normal distortion, the relative changes in pathological outlines will be noted. The advantage is claimed to lie in the fact that an x -ray installation of great power and high price is avoided.

THE RESULTS OF SALVARSAN TREATMENT IN DISEASES OF THE NERVOUS SYSTEM.

A REVIEW OF RECENT LITERATURE.

By SIDNEY I. SCHWAB, M. D., of the Editorial Staff.

1. Finger: Important Accessory Manifestations in Patients Treated with Salvarsan. (*Berl. klin. Wochenschr.*, No. 18, May, 1911.)
2. Westphal: A Death after Treatment with Salvarsan in Spinal Diseases (Tabes-Meningitis Spinalis Syphilitica) with Microscopical Examination of the Cord. (*Berl. klin. Wochenschr.*, No. 22, May, 1911.)
3. Mattauschek: The Results of Salvarsan Treatment in Nervous Diseases. (*Zeitschr. fuer die gesammte Neurologie und Psychiatrie*, April 11th, 1911.)
4. Schreiber: A Retrospective and Prospective View of the Present-Day Status of Salvarsan Therapy. (*Neurologisches Centralblatt*, No. 10, May 16th, 1911.)
5. Bresler: Salvarsan: The Ehrlich-Hata Remedy in Nervous Diseases of Syphilitic Origin. (*Psychiatrisch-Neurologische Wochenschr.*, No. 5, April 29th, 1911.)

Sufficient time has elapsed since the first reports of the effect of the treatment of salvarsan upon syphilis and nervous diseases due to syphilis to form some kind of an estimate of the present trend of opinion on the subject.

Inasmuch as the importance of the syphilitic origin of many diseases of the nervous system had been admitted even before Ehrlich's discovery and Wassermann's specific reaction, it is natural to expect that among the early cases upon which this remedy was tried were the various types of diseases of the nervous system due to syphilis. The principal question to be decided was, and is, whether some of the bad results following salvarsan injections in tabes, paresis and some other conditions were really due to the injection, or to the natural development of the disease itself.

Finger (1), in one of the early articles, entitled "Serious After-Results in Patients Treated with Salvarsan," makes particular note of the fact that the after-effects should be carefully studied and cannot always be explained by the relapses due to the progress of the disease. He says that if the theory that its symptoms are to be regarded as uninfluenced syphilis relapse—that is, symptoms that would have occurred even if salvarsan had not been injected, it should not be forgotten that in addition there are two other possibilities: One, the possibility of a direct relationship between the symptoms and the drug; then, the possibility of a combined effect of the arsenic with the syphilis, in the sense that the first creates a *Locus Minoris Resistentiae*, towards which the syphilitic infec-

tion tends to become localized. In some of the cases of nervous diseases in which salvarsan was tried this condition has been termed "Neuro-Recidiv," or what may be translated as the relapse of the disease expressed in new or recurring nervous symptoms. In this paper of Finger's he gives an account of three cases of optic neuritis which followed injections of salvarsan.

Westphal (2), in a very remarkable paper entitled, "Fatal Case of Tabes Plus Meningitis, treated with Salvarsan, with microscopic examination of the Spinal Cord," describes a case in which he demonstrates the weakness of the theory that symptoms on the part of the nervous system following salvarsan are to be attributed to the so-called neuro-recidiv. A résumé of his case is as follows: A syphilitically infected woman, who showed all the symptoms of a cerebrospinal meningitis of syphilitic origin, together with tabes, was given an injection of "606," in a neutral solution, in the right and left gluteal muscles, and seven hours afterwards there developed, suddenly, difficulty in breathing, followed by death, with the symptoms of respiratory paralysis. Particular attention is called to the disease foci located in the anterior roots of the third and fourth cervical segments. The conclusion to be derived from this case seems to be that in the presence of a process implicating the phrenic nerve, the salvarsan injection should certainly never be given. As it is impossible to know this before the injection, any meningitis which shows the slightest trace of cervical localization should be regarded as unfavorable for salvarsan injection.

Mattaushek (3), in an article which describes his experience in the treatment of various kinds of nervous diseases with salvarsan, calls attention to one case quoted by Spietoff, in which a patient with latent secondary lues and stupor developed epileptic attacks following the injection, and likewise the observation of Eversbusch, in which a child who had passed through meningitis three years before, became a victim of epileptic attacks following the injection. A number of cases of death following salvarsan injections are to be found in case reports of paresis in whom epileptic, or convulsive seizures are frequent. The material brought forward in this paper is concerned with 27 cases of various kinds, including latent lues, meningomyelitis, spinal lues, cerebral lues, etc. Of these 27 cases, 12 showed great improvement. In 12 cases of tabes the author quotes 5 as being favorably affected by the injection. His conclusions are about as follows: If salvarsan is used with perfect technique and method, it is almost without danger and is an unusually energetic and effective therapeutic measure for diseases of the nervous system caused by syphilis. Its results are much quicker than are obtained by the use of mercury or iodide. In early cases of cerebral and spinal diseases, where it is necessary to obtain prompt results, it is indicated. (In this respect the author differs essentially from Ehrlich's recommendations.) Even in tabes, especially in the active form, salvarsan gives good results, particularly in respect to the irritant symptoms. In early paresis, salvarsan may be permitted, but in well-developed cases there is no good result to be anticipated. As a relative counter-indication against the intravenous method can be mentioned heart failure, severe heart neurosis, arteriosclerosis, alcoholism and diabetes. Absolutely contraindicated are cases in which atoxyl, or any like preparation has been used, or nervous diseases in which the localization is found in important centres, especially in tumor cases, and particularly in advanced cases of paresis, in which convulsive attacks are found.

Schreiber (4) says, in a discussion on this subject, that the neuro-recidiv phenomenon will disappear if salvarsan is repeated in smaller doses. He considers that it is necessary to demonstrate the Wassermann reaction—not only in the blood, but also in the cerebrospinal fluid.

In an article by Bresler (5), entitled, "Salvarsan in Syphilitic Diseases of the Nervous System," the author has gone over carefully all the hitherto published cases on this subject. His article really forms a complete review of the subject; it goes through more than five numbers of the journal in which it is published, and is a complete résumé of the subject. He particularly makes note of the remarks of Ehrlich himself on the subject of "606." Inasmuch as frequently in the consideration of the effect of salvarsan on diseases of the nervous system, due to syphilis, the fundamental principles and conclusions of Ehrlich on the experiences hitherto obtained are lost sight of, it might be well to quote as follows: First, Ehrlich insists upon the specific and directly fatal effect of the remedy on the spirochæta. It does not penetrate into the tissues, the dose is too small, or the absorption insufficient, or the spirochæta from which its strength is derived is immune to arsenic. Secondly, the formation of specific antibodies in the use of "606" is shown by the fact that the milk of syphilitic mothers treated with "606" has been effective in the treatment of the hereditary syphilitic offspring. The serum taken from patients who have been cured by "606" exercises, after the injection, a curative influence upon the syphilitic products, particularly in the case of the new-born. This method is in cases of sucklings more effective than the injection of "606." In such cases the latter can be used afterwards as a definite therapy. Thirdly, the influence of the Wassermann reaction. It is given in a number of different percentages, since in many cases in the early stages of the primary effect, and sometimes in malignant syphilis, the negative reaction found at first becomes positive after the injection. This is explained by the fact that the number of spirochætae was too small to produce the Wassermann reaction, and it is by means of the injection of "606" and its effect in the dissolution of the spirochætae, and as a result of the reabsorption of the anti-toxin that the reaction becomes positive. The Wassermann reaction is in its last analysis the reaction of the organism to the reabsorption of the products of the spirochætae; that is, of the metabolic products, or endotoxins, so that in uncertain cases the injection of "606" can be of differential diagnostic importance. A positive Wassermann reaction that continues is a positive proof of the syphilitic character of the disease. A case in which the reaction remains positive after treatment must be regarded as uncured. With the disappearance of the reaction, the patient can be said to be cured if this disappearance is lasting; otherwise it may have to do only with a temporary negative phase, resulting from the fact that following the injection the number of organisms becomes so lessened that the remainder were too few to cause a reaction to take place.

The so-called Herxheimer reaction, Ehrlich explains as an evidence of the insufficient effect of the remedy, due to small doses, which causes merely an irritation of the spirochætae, thereby producing larger doses of toxin.

Ehrlich, at the time of his address, reports on a material of 10,000 cases treated with "606." There has been in this material not a single case of ocular disturbance which can be brought into relation with the drug. Only a few cases of death could be traced to the use of the drug. For example, a weak individual with tertiary lues of the larynx was given

the preparation in an acid solution; a very marked local reaction followed. Death was due to shock, which Ehrlich believes was due to the method of giving the drug. In other deaths amounting to scarcely a dozen, and had to do principally, or almost altogether, with patients with severe diseases of the nervous system, such as tabes and cystitis, cachexia, bulbar symptoms, extensive cortical softening and similar conditions. In one case, syphilitic disease of the phrenic nerve, due to a meningitis in the cervical cord, was the cause of death. Ehrlich insists that, when the drug is used in individuals who are victims of otherwise fatal diseases, death resulting cannot be wholly laid to the door of "606." He recommends, according to Alt, in nervous diseases due to syphilis, that not over 0.4 gm. be given. The spirochætæ are present in small numbers, and for that reason smaller doses of "606" result in the killing of the organisms. According to Alt, about 75 per cent. of the deaths which have followed the use of this drug have been found in cases of severe diseases of the nervous system. "606" not only kills the spirochætæ that can be easily reached, but also those in all syphilitic new growths and tissues. The dissolution and disturbance of these structures cause a kind of inflammatory process to be set up; thus in the brain or spinal cord such a change of the local and general pressure might cause symptoms of paralysis, or irritant phenomena, which, as a rule, are only temporary. In all cases in which there is a tendency towards excitement, or convulsions, the remedy should not be used, and should not be used in old cases of paralysis, or when the paralysis has become spastic in type. In the early stages of tabes a great many have shown subjective and objective improvement.

Wechselmann saw in a great many cases of tabes, definite improvement. In several cases of optic neuritis, the result of "606" was favorable; likewise in cases of a beginning or advanced optic nerve atrophy. Wechselmann found that following the injection, the process did not seem to advance, but he has never observed that the patient grew worse. According to him, a fresh optic neuritis is a contraindication against the treatment. (It might be added here, by way of remark, that in conclusions of this kind, which the followers of Ehrlich are prone to emphasize, the question of time is important. Inasmuch as the whole subject of "606" is only two or three years old, the remark by Wechselmann, that he had seen no bad results in optic atrophy following the injection, is altogether premature, and such uncritical remarks should be severely condemned. Nor must it be forgotten, either, that an optic atrophy is frequently stationary and shows improvement, or slight improvement, with many other drugs besides either "606" or mercury.)

Stern, in a case of syphilitic meningomyelitis, saw no result four weeks after the injection.

Scholtz gave the injection in 2 cases of labyrinth lues. At first the tinnitus was worse, but after about two weeks there was some slight improvement.

Gruven calls attention to the fact that not only syphilitics, but also non-syphilitics show general constitutional improvement following the injection; therefore, he recommends its use in a greater variety of non-specific cases.

Friedlander reports the results of 14 cases of syphilitic nervous diseases upon which "606" was tried. These were chiefly tabes, pseudotabes, and muscle paralysis and headaches. Subjectively, in all of these cases the treatment was effective. The patients felt more cheerful and stronger.

Objectively, a favorable influence of the treatment on the patient, especially on the gastric crises, but particularly its influence on the unbearable and depressing headaches must be mentioned; in a few days such symptoms disappeared.

Blumenfeld remarks that luetic headaches frequently disappeared in twenty-four hours.

Ledermann saw no result in cases of tabes three weeks after the injection. In one case of tabes the ataxia did not seem to be much influenced.

The criteria for improvement, permanent or temporary, in these articles are extremely intangible. Improvement may mean absolutely nothing in cases of this kind, because it may be solely the mental reaction, due to a new method of treatment for which great hopes are held out. In none of these reports, seemingly, do the authors submit any positive anatomical proofs that the treatment has in any way affected the organic basis of the disease. Such improvements as have been noted in the majority of the cases have been obtained frequently by other means, which are not specific in the sense of aiming directly at the origin of the disease-process.

Marschalko believes that among those who have had sufficient experience with salvarsan, the fear of the bad results of the injection on the optic nerve has not been realized. Even beginning atrophy of the optic nerve is, according to him, no contraindication for the use of the remedy—that is, if it is advisable to use it on other grounds. He has records of several such cases from the eye clinic, that received injections and showed no bad effects. He believes that he has seen in some cases an improvement. He describes one fatal case in a forty-two-year old man who had suffered for a long time from paresis. From this and other experiences, Marschalko has excluded from the class, which might be benefited by “606,” paralytics in the advanced stage. He can report no special results, but in some cases a very definite period of remission. How far this bears any relation to the specific effect of the remedy, he leaves in doubt. In 2 cases, at any rate, together with the period of remission there appears a definite lessening of the positive Wassermann reaction. Marschalko reports more favorably in tabes. In two cases of beginning tabes the results, according to him, were brilliant. In one, the rigidity of the pupil, which had existed for several months, disappeared. In another case, the gastric crises, which had existed for four years, together with lancinating pains, disappeared six days after the injection. All these favorable conditions remained three months after the injection. In two other cases of old tabes, of eight and twelve years’ standing, the high degree of ataxia became better and the patients themselves felt much stronger.

Deutschmann attempts to compare the symptoms on the part of the eye produced by “606” and those found in the eye in cases of chronic arsenic poisoning, taking as his data particularly the Manchester epidemic of 1900. The theory as pointed out in this paper is wrong, because in “606” injections the arsenic is found in the blood-stream and has a particular and constant effect on the optic nerve, by means of lymph through the nerve sheaths; this is not the case in the epidemic cases.

Torday gives an account of 16 cases of tabes treated with “606.” It showed no good results, nor did it in cases of progressive paralysis, dorsal myelitis and epilepsy. On the other hand, in one case of cerebral gumma, on the first day after the injection, the headache, vertigo and

nausea disappeared and the gait became normal; the ptosis, the abducens paralysis and diplopia remained unaffected. The latter group of symptoms, however, disappeared promptly a few months later under mercury.

Kribich states that the neuro-recidiv has become the central theme of importance in the whole question. If it is found that after salvarsan injections there is a renewal of symptoms, then the new therapy will fail, as far as nervous diseases are concerned. If, on the other hand, by means of the intravenous injection, the relapses can be prevented, or influenced, by the treatment, then we are in a position to believe in a remedy whose results in many cases belong to the most imposing which the physician has had an opportunity to see, as far as instantaneous, or almost instantaneous, curative results are concerned. He finds that cases of neuro-recidiv are generally found in intramuscular, or subcutaneous injections. They do not seem to occur as frequently by the intravenous method. The harm to the nervous system can be explained if this fact is substantiated by the longer period of arsenic reabsorption from the arsenic deposit in the muscles.

Bettmann has observed 2 cases of herpes zoster following salvarsan injection.

Weintraud in about 30 cases of tabes and one case of paralysis noticed no improvement. Cases with arteriosclerotic disease of the brain, based on syphilis, and those who had a number of apoplectic attacks, seemed to bear the intravenous injection very well and even showed some improvement.

Enough quotations from Bresler's article have been given to show the extent and large clinical material over which the Continental men have command. It seems that the German physicians, especially, are using "606" in a great many more instances of nervous diseases than we are. They do not in any sense seem to fear the results, as far as the eye is concerned, that we do in this country. In trying to arrive at some conclusions as to the value of "606" in this class of cases, we are met with a mass of data which is in no condition either to be understood or utilized. The constant repetition of improvement, or the reverse with no particular data nor any definite determination of what improvement means, certainly leaves the investigator as doubtful as ever. One thing only seems to be assured, and that is, that in advanced cases of paresis and in such cases in which epileptic seizures are common, "606" is detrimental. There is no record of any cured cases of tabes or paresis. There are no records, as far as the present writer can ascertain, of "606" accomplishing more than was previously accomplished by mercury—that is in cases of paresis, tabes, and cerebrospinal syphilis in early stages. There is certainly greater mortality and a greater danger in the use of "606" than there is in mercury, and for that reason, all things being considered, the use of "606" should be limited to that kind of case which shows no response to mercury.

It must be further understood that if an individual who happens to have a nervous syphilis has need of the "606" treatment as far as his general symptoms are concerned, and because he has been inadequately treated in the first instance, the existence of his nervous syphilis should not be considered in the light of a contraindication. [Ed.]

NASAL TUBERCULOSIS.

A REVIEW OF RECENT LITERATURE.

By WILLIAM B. CHAMBERLIN, M. D., of the Editorial Staff.

1. Caboche: Contribution to the Study of Tuberculosis of the Nasal Mucosa. (*Archives of Otology, Rhinology and Laryngology*, Vol. 17, pp. 180-242, 1908.)
2. Chiari: Tuberculomas of the Nasal Mucous Membrane. (*Archiv. fuer Larynologie*, Bd. 17, pp. 454-483, 1905.)
3. Gerber: Tuberculosis and Lupus of the Nose. (*Handbuch der Larynologie und Rhinologie*, Bd. 3, pp. 901-930.)
4. Gerst: As to the Manifestations of Nasal Tuberculosis. (*Archiv. fuer Larynologie*, Bd. 21, pp. 309-324, 1908.)
5. Gleitsmann: Treatment of Tuberculosis of the Upper Air-Passages. (*Archiv. fuer Larynologie*, Bd. 21, pp. 111-119, 1908.)
6. Hajek: Tuberculosis of the Nasal Mucous Membrane. (*Internationale Klinische Rundschau*, 1889.)
7. Katz: Tuberculosis of the Nasal Septum. (Diseases of the Nasal Septum, pp. 83-100.)
8. Onodi (*Deutsch. med. Wochenschr.*, 29, 1906).
9. Pasch: Clinical Contribution to Nasal Tuberculosis. (*Archiv. fuer Larynologie*, Bd. 17, pp. 454-483, 1905.)
10. Renner: Nasal Tuberculosis. (*Annals of Otology, Rhinology and Laryngology*, September, 1909.)
11. Roehenbach: Nasal Tuberculoma. (*Archiv. fuer Larynologie und Rhinologie*, XXIV., No. 2, p. 231.)
12. Schmidt: Diseases of the Upper Air-Passages.
13. Thrasher: Report of a Case of Nasal Tuberculosis. (*Lancet-Clinic*, 1905.)
14. Zarniko: Diseases of the Nose and Naso-Pharynx.

Nasal tuberculosis is an affection rarely met with or at least rarely reported. Thrasher in reviewing the literature in 1905 collected 112 articles with 125 cases reported; while Chiari in 1894 reported only 21 cases, six of these being his own. If one accepts the theory of Koch and his followers that the inspired air is the principal source of tubercular infection, this immunity of the nasal mucosa is indeed striking; for this is the portion of the respiratory tract with which the air-stream first comes in contact. In addition, the cartilaginous septum, the favorite location for tubercular involvement, is subjected to frequent insults from scratching with dirty and infected finger nails and handkerchiefs; not to mention the irritation from the inhalation of dust-laden air. This immunity of the nasal mucosa may be attributed to the filtration action of the vibrissæ, the currents caused by the ciliated epithelium, and the well-known bactericidal action of the nasal secretion. Such natural

barriers are partially overcome, at least in the cases of nasal stenosis so frequently met with, the moist and warm vestibule of the nose furnishing here an ideal spot for the settling and rapid growth of all sorts of organisms.

Zarniko classifies tubercular involvement of the nose in two main divisions: (1) the tuberculoma, or proliferative type, usually met with in strong, robust individuals and regarded as the primary form, and (2) the ulcerative, occurring as an end-infection and complicating a primary tuberculosis of the lungs and larynx. Renner, quoting Gerber in Heymann's "Handbook," makes four divisions: (1) tuberculous ulcer, (2) diffuse infiltration, (3) tuberculoma and (4) lupus. Diffuse infiltration and tuberculoma he regards merely as stages of the same process, while the term lupus he considers may well be dropped, inasmuch as this is merely the term applied by the dermatologist to a lesion of the nasal mucosa which has extended to the nose and face. Professor Gleitsmann adopted the above classification in his report at Vienna in 1908; but Hajek, Michelson and Zarniko have given up entirely the term nasal lupus and speak only of nasal tuberculosis. This classification of the proliferative form as primary, and the ulcerative form as secondary seems rather too arbitrary, for pulmonary tuberculosis can by no means be excluded simply because definite physical signs are absent. It would seem that the question of primary and secondary forms might well be left to the speculation of metaphysicians, and that we as clinicians concern ourselves rather with the manifestations of the different forms as we find them.

The proliferative form of nasal tuberculosis, as before mentioned, is found more frequently in strong, robust subjects, and attacks by preference the cartilaginous septum. The bony septum, nasal floor and turbinates may be involved secondarily. The form of the neoplasm may vary from low or high granulations with a broad base, to even a polypoid tumor with distinct pedicle. The latter form, however, is rare. The color may be a dull dirty gray, pale red or even purple; while the character of the surface, as well as the consistency, may suggest sarcoma. The absence of pain is a striking feature, patients as a rule seeking relief only on account of the nasal obstruction. Feter is usually absent. Although the tendency to ulceration is slight, areas of necrosis may usually be found, with sharp undermined edges and bases covered with secretion and low granulations. Neighboring structures are involved by continuity; mucosa, bone and cartilage being in turn attacked and perforation of the septum in time resulting.

The disease is usually one of great chronicity, terminating in time, if unchecked, in a descending tuberculosis of the naso-pharynx, pharynx, laryngeal tonsils, larynx and lungs. As complications may be mentioned secondary involvement of the accessory lymph glands, the middle ear by way of the Eustachian tube, and the conjunctiva through the tear-ducts. The tip of the nose and adjacent portions of the face may present the usual evidences of lupus. It is on account of the latter affection that many patients first consult a dermatologist.

The histological picture is fairly characteristic, with diffuse heaping up of round cells and typical giant-cell tubercles. While the tendency to caseation is slight, most authors regard the finding of such areas as important for the diagnosis. The finding of the tubercle bacilli *in situ* is often a matter of extreme difficulty. In the purely proliferative form they are also rarely met with in the nasal secretion. Renner asserts that

in the proliferative form an absolute diagnosis cannot be made clinically, but only by microscopical examination, and cites Onodi who diagnosed a tumor of the septum as carcinoma from the clinical picture and microscopical examination of an excised portion. After radical removal of the tumor he found it to be a tuberculoma. In the ulcerative type the clinical diagnosis, without microscopical examination, is fairly easy.

Zarniko considers the differential diagnosis from syphilis as being the most difficult and mentions the following points:—

1. Syphilis is associated with an intense inflammation of the surrounding mucosa; tuberculosis is not.

2. Syphilis involves primarily the bone; tuberculosis the cartilage.

3. Feter is usual in syphilis; rare in tuberculosis.

4. Headache and involvement of the branches of the trigeminus are common in syphilis; wanting in tuberculosis.

As additional points in the differential diagnosis may be mentioned the histological examination, the administration of potassium iodide, the Wassermann reaction and the injection of tuberculin. The general examination should not be overlooked, though Zarniko calls attention to the fact that we may find syphilis in a tuberculous subject. As a rule, the differentiation from sarcoma and foreign bodies covered with granulations presents lesser difficulties in diagnosis.

The treatment of nasal tuberculosis is entirely surgical and consists first in the removal of all new growths with snare, forceps or curette, and the treatment of the resulting wound with lactic acid, the electro-cautery or dry superheated air, until epithelialization takes place. Such treatment results in most cases in a retarding of the process; often in complete cure. The care of the general health of the patient should not be overlooked: fresh air, forced feeding, and local cleanliness.

Whereas the first form of nasal tuberculosis is found in subjects in apparently good health; the second, or ulcerative form, occurs usually in those in whom the general disease is far advanced. The outlook here, as in secondary involvement of the pharynx and larynx, is proverbially bad. Diagnosis, in view of the general condition of the patient, presents few difficulties, while treatment is, in the main, palliative only.

THE RELATION OF PREGNANCY AND LABOR TO CARDIAC DISEASE.

A REVIEW OF RECENT LITERATURE.

By HUGO EHRENFEST, M. D., of the Editorial Staff.

1. Blacker: Heart Disease in Relation to Pregnancy and Labor. (*British Medical Journal*, May 25th, 1907.)
2. Cameron: Heart Disease and Pregnancy. (*Amer. Journ. of Obstetrics*, September, 1908.)
3. Fellner: Heart and Pregnancy. (*Monatschr. f. Geb. u. Gyn.*, Vol. 14, p. 370.)
4. Green: Blood Pressure in the Toxemias of Pregnancy. (*Boston Med. and Surg. Journal*, April 28, 1910.)
5. Harrar: Management of Cardiac Disease with Broken Compensation During Pregnancy and Labor. (*Bull. of Lying-in Hospital of New York*, 1909.)
6. Hirschfelder: Diseases of Heart and Aorta. J. B. Lippincott & Co., 1910.
7. Hirst: Importance of the Blood-Pressure in the Toxemias of the Latter Half of Pregnancy. (*New York Med. Journ*, June 11th, 1910.)
8. Jaschke: Marriage of Cardiopathic Girls. (*Muench. Med. Wochenschr.*, Nov. 22nd, 1910.)
9. Jaschke: Prognosis of Pregnancy and Labor in Cases of Cardiac Disease. (*Archiv. fuer Gynaek.*, Vol. 93, p. 466.)
10. Link: Accidental Heart Murmurs in Pregnant Women. (*Muench. Med. Wochenschr.*, April 14th, 1908.)
11. Mackenzie: Diseases of the Heart. Oxford University Press. 1910.
12. Moran: Heart Diseases in Pregnancy and the Puerperium. (*Amer. Journ. of Obstetrics*, July, 1910.)
13. Pouliot: Pulmonary Edema During Pregnancy and Parturition. (Original in *Archives Générales de Médecine*, December, 1909. Reviewed in *Journ. Amer. Med. Assoc.*, Feb. 19th, 1910, p. 658.)
14. Slemmons and Goldsborough: The Obstetrical Significance of the Blood-Pressure. (*Johns Hopkins Hospital Bull.*, 1908, p. 194.)
15. Starling: Value of Blood-Pressure Determinations in the Toxemia of Pregnancy. (*Lancet*, Sept. 10th, 1910.)
16. Wenczel: Pregnancy and Labor in Women Suffering from Heart Disease. (*Monatschr. f. Geb. u. Gyn.*, Vol. 26, p. 506.)

Recent literature has not revealed any new or startling changes in the views concerning the intricate relation of pregnancy and labor to the normal or diseased heart. Rather gradually have we been persuaded that most of the older writers have exaggerated the dangers of impregnation

for the woman suffering from a cardiac disease. "No marriage for the unmarried, no pregnancy for the married, no nursing for the confined" is a harsh rule laid down by a French writer and quoted in many textbooks, but lately usually with the restricting statement, that it is not entirely compatible with the results of recent investigations.

In studying the mutual influence of pregnancy and cardiac disease upon each other the following points are of main importance: 1. The effect of normal pregnancy upon the normal heart; 2. The effect of a pathological pregnancy upon the normal heart; 3. The effect of pregnancy and labor on the diseased heart; 4. The effect of cardiac diseases on pregnancy; 5. The treatment of heart disease complicated by pregnancy, with special consideration of the question of artificial abortion; 6. The management of labor, and 7. The problem of matrimony for the sufferer of a heart lesion.

The Effect of Normal Pregnancy upon the Normal Heart.—According to Hirschfelder, the effect of pregnancy upon the heart is influenced by several factors. The gradual pushing upward of the diaphragm as the uterus grows causes the heart to assume a more transverse position, raising the apex usually to the fourth interspace. A reflex vagus inhibition is often present. During pregnancy the heart is forced to put forth increased efforts. Slemons and Goldsborough have confirmed Fellner's previous findings, that during pregnancy the average blood-pressure, pulse-rate and cardiac output are larger than in the non-pregnant woman. Hirst found in 100 non-pregnant women the blood-pressure, measured with Faught's instrument, to average 112 mm. Hg. In 100 normally pregnant women, who at no time showed albuminuria or any constitutional sign of toxemia, the pressure was found to be 118. In the last third of pregnancy the blood-pressure seems to rise gradually, averaging, in the middle of the last month, 124. According to Slemons during the labor pains there is often a rise of 50 mm. Hg. in the maximal pressure, though these elevations are of short duration.

The increase in size of the heart, supposed to represent a hypertrophy developed as a result of the prolonged increase in work, as Hirschfelder states, is probably due in part to dilatation of the heart, and in part only suggested by the increased area of dullness resulting from the change in position of the heart. James Mackenzie has shown that the dilatation during pregnancy affects the right heart particularly, and that in very many cases even of otherwise normal women a definite insufficiency of the tricuspid valve may appear, disappear and reappear. The presence of this insufficiency is shown both by the positive venous pulse and the systolic murmur in the tricuspid area. In this connection Link's article must be mentioned, calling attention to the frequent appearance of accidental non-organic murmurs during pregnancy. Examining 330 apparently healthy pregnant women he was able to detect an accidental murmur in 41 (12.4 per cent.). Only in 3 of them, one being markedly chlorotic, this murmur could be heard after labor. Discussing the various theories offered in explanation of this phenomenon, he comes to the conclusion that this murmur is caused by a slight kinking of the larger vessels, especially the pulmonary artery, as the result of that peculiar dislocation of the heart during pregnancy. It is obvious that special care must be taken in the differentiation of this accidental murmur from one produced by a mitral insufficiency. In the latter the murmur is most distinct over the apex and less pronounced over the pulmonary artery. The non-organic murmur of pregnant women is practically limited to the area of the pulmonary artery.

Moran considers it quite possible that varying degrees of temporary dilatation of the heart occur in pregnancy, similar to that appearing after great exertion. In this manner the cardiac mechanism is capable of maintaining the circulatory equilibrium without undergoing appreciable hypertrophy or increasing markedly the blood-pressure.

The Effect of a Pathological Pregnancy upon the Normal Heart.—Interest in the question of the effect of a pathological pregnancy upon cardiac function has been awakened with the introduction of reliable and practical instruments for measuring the blood-pressure. We have already referred to Hirst's investigations concerning the normal blood-pressure in pregnancy. In 39 women suffering from eclampsia, and in 18 others with a marked albuminuria he found the pressure at its lowest at 142 mm. Hg. The highest blood-pressure recorded in a woman without eclampsia was 192 mm., the highest in a woman with eclampsia was over 320 mm. Starling is convinced that during the whole period of a normal pregnancy the blood-pressure remains approximately normal, *i. e.*, varies between 110 and 120 mm. Any rise above 125 would make him suspicious that the pregnancy was not quite normal and would put him on the look-out for some degree of toxemia. Of course, any rise at the beginning of labor or during its course is due entirely to the pain or muscular exertions. According to Green, in impending, mild, and acute cases of eclampsia the blood-pressure increases markedly and falls after delivery as the symptoms subside. In very grave and fatal cases there is an extreme increase in the pressure. In eclampsia the blood-pressure seems definitely related to the type of case and, therefore, its observation is of value in prognosis and treatment. In cases of chronic nephritis, *e. g.*, the toxemia is relieved by delivery, but the cause is not removed, and in these cases the pressure remains at an abnormal height. There are other non-toxic renal conditions observed during pregnancy, differentiable by the persistently low blood-pressure.

The Effect of Pregnancy and Labor on the Diseased Heart.—In the belief of the internist, pregnancy is one of the most serious complications of cardiac disease. So eminent a physician as Leyden claimed that about 40 per cent. of all women with serious heart lesions meet their death in connection with childbirth. In the light of very large statistics compiled by obstetricians, such views are erroneous and greatly exaggerate the actual dangers. Investigations made by Fellner on the immense material of Schauta's clinic, and to-day quoted by every contributor to this subject, have led to a distinct change of opinion. Fellner believes that in obstetrical work only in about 14 per cent. of the cases is the presence of the heart lesion actually recognized, while probably in 86 per cent. of the cases this complication is overlooked because the cardiac symptoms do not become manifest. The infrequency of heart disease during pregnancy, Moran writes, emphasizes the importance of a thorough physical examination of the patient and constant supervision during gestation, in order that the complication may be promptly detected, and such measures undertaken in the interest of the mother and infant as the exigencies of the case may determine. Reference must be made in this connection to the fact that the introduction of Momburg's belt constriction makes the careful examination of the heart of every pregnant woman imperative because the application of the belt is strictly contraindicated in the presence of any form of cardiac anomaly. But during pregnancy unusual difficulties present themselves in the diagnosis of minor cardiac lesions and in the detection of a break in compensation, probably the most important feature from a prac-

tical point of view. There are a change in the position of the heart, changes in the area of dullness, changes in pulse-rate and blood-pressure and frequently, as mentioned, accidental murmurs appear, or even a "physiological" relative tricuspid insufficiency of muscular origin (Mackenzie) may exist. Edema of the lower extremities or even of the genital organs may be caused solely by the pressure of the heavy uterus against the pelvic veins. In the last third of pregnancy dyspnea is rather commonly met with. The diagnosis of a broken compensation during pregnancy, therefore, as Hirschfelder states, depends upon signs which are relative rather than absolute. "Dyspnea and cyanosis on very slight exertion, such as quietly walking a distance of a few hundred yards or less, walking up a few stairs, etc., and the presence of a small rapid pulse, persistent cough, enlargement of the liver, and edema of feet and legs may be regarded as the most important symptoms. The earlier in pregnancy they occur, the more alarming they are."

The dangers of heart lesions in pregnancy, according to Jaschke who made a very extensive study of the question, in general is overrated. Valvular lesions, at least, are not as dangerous as is often stated, and this also holds true for the mitral stenosis. Quite different is the situation in regard to diseases of the heart muscle, especially in the cases of chronic myocarditis due to infections or intoxications. They often lead to serious complications. In the opinion of Cameron, the primiparity or pluriparity of the patient (representing a marked difference in duration and severity of labor), her general health and nutrition, the condition of the kidneys, the amount of compensation present and the ease with which it is upset or restored, the patient's ability to remain quiet in bed free from exertion and excitement, and the way in which she responds to treatment—all these things are of more importance in estimating the probable outcome than the kind of anatomical lesion present. Similar views we find expressed by Harrair: While the complication of pregnancy and labor with failing or lost compensation is not very common, it is of greatest importance because the mortality both of mothers and children under these condition is very much greater than is commonly supposed. The particular nature of the cardiac lesion does not seem of great importance as regards the prognosis. The prognosis is distinctly impaired in the presence of a renal lesion. Among recent writers we find only Wenczel expressing the belief that his own experience bears out the claim generally made that a mitral stenosis offers special dangers. The particular nature of the heart lesions, as Moran points out, has considerable bearing on the clinical phenomena resulting from them. Mitral insufficiency predisposes to asystole and edema, aortic insufficiency to syncope and epistaxis, while mitral stenosis may lead to cerebral embolism, post-partum hemorrhage and hemiplegia. Pouliot discusses the special danger of an acute edema of the lungs, one of the gravest complications of parturition, both for mother and child. The resulting asphyxiation of the mother invariably leads to the intrauterine death of the fetus.

The two main dangers arising from the complication of a cardiac lesion with pregnancy are the break of compensation, already referred to, and degenerative changes in the myocardium with consequent cardiac failure. Mackenzie emphasizes the importance of this fact. If it be borne in mind that heart failure is essentially a question of the integrity of the heart muscle, a better standpoint will be obtained for judging these cases. The valve lesion in the great majority is at the most only an embarrassment to the heart in its work, and one which it may easily overcome. The

presence of the lesion, however, is important in that it calls attention to the heart and may remind us that the disease which has injured the valve may also have injured the muscle. Our object must be to find out in these cases the extent of the lesions to the muscle, and how far the valve lesion embarrasses the muscle. Given a fair response to increased efforts with no or little enlargement of the heart, then pregnancy need have no terrors. If the response is limited, if palpitation is readily induced by exertion, opinion should be suspended until the result of treatment is ascertained. If the condition does not improve then the outlook is not hopeful. It must be kept in mind that patients with valvular lesions may suffer from most severe heart failure (dilatation and extensive dropsy), and make such good recoveries, that repeated pregnancies may be undertaken with impunity. Mackenzie calls attention to the fact, undoubtedly often overlooked by the obstetrician, that after the delivery is over the patient is not out of danger, for symptoms of severe heart failure may supervene any time within the next three weeks.

The Effect of Cardiac Disease on Pregnancy.—The effect of a cardiac lesion on a coexisting pregnancy finds its most pronounced expression in the premature expulsion of the uterine contents. It is this fact which accounts chiefly for the high fetal mortality of a complicating maternal heart lesion given by Harrar as 33 per cent. Fellner, whose figures are very low, places the frequency of premature spontaneous termination of pregnancy at 20 per cent., other writers at from 40 to 60 per cent., *e. g.*, Blacker at 44 per cent. Jaschke, who contributes the most thorough of recent studies, even believes that valvular lesions do not seem to predispose to premature termination of pregnancy. Abortion actually seems to occur only if the compensation becomes disturbed. The spontaneous premature termination of pregnancy is ascribed to various causes. Circulatory disturbances lead to congestion of the endometrium. Rupture of vessels results in apoplexies of the placenta or hemorrhages between placenta and decidua. The prevalence of placenta circumvallata in cardiopathics has been explained by circulatory difficulties in the peripheral portions of the placenta. If placental respirations is interfered with or the oxidation of the maternal blood becomes defective, the fetus may die in the uterus from asphyxiation. In some instances the carbon-dioxide intoxication of the mother causes premature uterine activity.

The Treatment of Heart Disease Complicated by Pregnancy, with Special Consideration of the Question of Artificial Abortion.—While most writers agree that a cardiac lesion during pregnancy calls for the customary general and medicinal treatment without any special consideration of the coexisting pregnancy, the same consensus of opinion is lacking in regard to the value of artificial interruption of pregnancy in certain cases. Clinicians, like Leyden, who believe that pregnancy places every cardiopathic woman in great danger, plead for an extensive use of artificial abortion early in gestation. As a rule, obstetricians are more conservative. The gravest dangers to the mother undeniably develop during labor itself, and this fact should be kept in mind whenever the termination of pregnancy is considered. It makes the prognosis of interference less favorable in all serious breaks of compensation when the thought of obtaining relief by emptying the uterus suggests itself most forcibly. Hence, artificial interruption of pregnancy cannot be accepted as a routine procedure. However, there is no doubt that this radical form of treatment is permissible and will prove advantageous under certain conditions. The

indication for the operation will be ascertained by careful treatment and by careful study and observation of its effect in the individual case. If interruption of pregnancy has been decided upon, that method should be resorted to which will guarantee the shortest labor and the least strain on the patient.

Blacker thinks that in the great majority of instances the ordinary medicinal treatment suffices, and that only in the cases of exceptional severity the induction of abortion or of premature labor becomes necessary. According to Harrar interruption of pregnancy is seldom expedient. He enumerates the following indications for interference: 1. If compensation fails badly before the sixth month of pregnancy; 2. If compensation is not regained after a month's rest in bed with use of the customary medicinal and general therapeutic measures; 3. At or after the thirty-sixth week of pregnancy in an attempt to ensure an easier labor; 4. In desperate cases, or when patient is moribund, for the purpose of saving the child. Jaschke believes that only serious decompensation, occurring possibly only in one per cent. of all cases, may justify artificial termination of pregnancy. The most complete description of the medicinal and general treatment of these cases is given by Hirschfelder. As long as compensation is good the patient should merely be carefully watched but no medication need be resorted to. At the first sign of cardiac weakening or dilatation (dyspnea and cyanosis, etc., on slight exertion), absolute rest should be insisted on and digitalis or strophanthus should be given. This procedure should be insisted upon even if the diagnosis of organic valvular lesion is not definite, for these procedures will afford quite as much relief in cases of functional tricuspid insufficiency. Moreover, they should be repeated at the slightest indication, especially toward the end of pregnancy. It is advisable to give in such cases a few prophylactic doses of digitalis when labor seems imminent, or a few doses of strophanthus at the beginning of labor pains, so as to have the tonus of the heart muscle at its optimum by the time the strain of the second stage of labor is imposed upon it. At periods of acute dilatation, and especially when pulmonary edema sets in, venesection affords the greatest relief. If cardiac symptoms disappear the patient may gradually be allowed up and around, but she must be more careful than before, and if signs of a second break in compensation occur, termination of the pregnancy should be seriously considered. This is especially true in cases of mitral stenosis in which the cardiac accidents of pregnancy are particularly frequent. Hirschfelder thinks that Fellner's strikingly low mortality in this particular type of cardiac lesion is probably due to the practice of the Schauta clinic, to terminate pregnancy in cases of mitral stenosis as soon as the slightest signs of broken compensation appear.

The Management of Labor.—In the presence of an uncompensated heart lesion, labor must be managed with particular care. If there is the slightest sign of heart failure, Mackenzie writes, the patient should be instructed not to bear down, and chloroform should be administered very early, the anesthesia being gradually deepened. As soon as it is feasible, forceps should be applied, and gentle, firm traction intermittently maintained until delivery is effected even if forceps have to be on for a considerable time. "I have never seen the slightest risk from chloroform in these cases." And I may quote here a sentence written by Hirschfelder: "As in other conditions, ether is preferable to chloroform when the heart is diseased."

Most writers advise shortening of the duration of labor, especially of

the most dangerous second stage, by manual or instrumental dilation of the cervix, by applying the forceps, or resorting to version and extraction. Patients with a pronounced dyspnea feel more comfortable in a high reclining position during labor. It is a generally accepted practice to bandage the patient's abdomen or to place a heavy sandbag (8 to 10 lb.) upon her abdomen as soon as the baby is born. This is done for the purpose of preventing a too rapid fall in the blood-pressure by a sudden filling of the abdominal blood-vessels. Such treatment will be most effective if the sandbag is placed on the abdomen before the fetus is expelled. Harrar advises the application of the forceps with the patient in the sitting position. If in the third stage the pulse becomes irregular and weak with evidence of a dilatation of the right heart, a post-partum hemorrhage is to be encouraged. For this reason many writers advise against the use of ergot after labor in these cases. Occasionally when the pulse is small and weak without symptoms of dilatation of the right heart, the tight abdominal binder is strictly indicated. Jaschke, whose very conservative views have been recorded repeatedly in this article, states that during labor a complicating heart lesion can be considered neither an indication for, nor a contraindication against operative interference. In view of the possible grave danger of a suddenly developing pulmonary edema, Pouliot advises to be in readiness to hasten delivery by instrumental measures, if necessary. He emphasizes that salt solution, whenever required, should be given only in fractional doses and subcutaneously, never intravenously. Asphyxiation is best combated by immediate venesection, withdrawing at least 500 grms. of blood. The danger from loss of this amount of blood when the woman already has lost a considerable quantity is much less than the danger from the acute edema of the lungs. The heart should be maintained in serious cases in the meanwhile with the usual tonics. He advises injecting up to 10 c.c. of a 10 per cent. solution of camphorated oil, which is not only a vigorous tonic for the heart, but also has a sedative action on the respiratory spasm.

Brief mention must be made in this connection of the attitude of various writers concerning the advisability of permitting mothers suffering from heart lesions to nurse their children. It seems obvious that in very serious cases breast-feeding is contraindicated. While in less serious cases the placing of the child on artificial food ensures to the mother more quiet and rest, which may seem advantageous, it must not be forgotten that this expected advantage may be more than offset by mental anxiety and worry of the mother, if the usual difficulties are encountered with the artificial feeding of the child, which in these instances often is born in a weak and frail condition.

The Problem of Matrimony for the Sufferer of a Heart Lesion.—A striking disharmony of opinion still prevails concerning the one eminently important problem of matrimony for the girl suffering from a cardiac lesion. I have already quoted the French writer who unconditionally denies to the cardiopathic woman the right to marry. Among recent writers I find only Moran taking a similarly radical attitude. He is firmly opposed to marriage, "for no matter how well compensated the lesion is, pregnancy always exerts a baneful influence, exposes the patient to the danger of toxemia and dystocia, while if she passes safely through childbirth she may be left with a crippled heart for the remainder of her life." Such an attitude seems indefensible. First of all, matrimony and pregnancy are not identical terms. Reliable statistics furthermore prove convincingly that a large number, in all probability the largest

majority of women with well-compensated lesions, pass through pregnancy without any noticeable ill effect. Marriage to many girls means an improvement of their social conditions, it may mean a life of comparative ease as compared with the possible necessity of earning a living by work. These are factors worth considering when the physician is asked the question whether a certain girl should be permitted to marry. The indiscriminate denial of marriage to all women having valvular lesions would imply inexcusable injustice to many of them.

In cases of valvular lesions, Blacker writes, heart failure will occur sooner or later, but whether its onset will be precipitated by childbearing admits of argument, and it is doubtful if the risk of this is so marked as to justify denying her the right to marry. In the opinion of Jaschke a compensated heart lesion offers the right to prohibit matrimony only in the presence of a concomitant pulmonary or renal disease. In view of the undeniable dangers of an accompanying myocardial affection, however, he emphasizes the necessity of careful functional tests before permission to marry is granted. He also believes that an essential paroxysmal tachycardia will make it advisable to counsel against matrimony. To avoid the dangerous complication of an acute pulmonary edema during labor, Pouliot would exclude from marriage the girls who have an adherent pericardium, and those in whom a mitral lesion is complicated by an albuminuria. I shall close with a quotation from Mackenzie: "The nodal rhythm should be a bar to pregnancy in all cases. Although the valvular lesion by itself is not a contraindication, yet the particular valvular lesion influences the decision when it is combined with indications of muscle failure. Thus aortic lesions are very serious unless there be a good intact heart muscle. Mitral stenosis, when there is only a presystolic murmur and good effective muscle, is no bar; but if there is also a diastolic murmur, then unless the muscle is very good, pregnancy should not be permitted, as the diastolic murmur points to a progressive narrowing of the orifice."

Consistently, only the question of permission to become pregnant should be considered in relation to the problem of cardiac disease. Very often the physician is called upon to act as judge after marriage has been consummated, often after one labor has brought the patient into a serious condition. He will have to decide whether the prevention of impregnation seems permissible, desirable, or is absolutely necessary, and in the latter situation will have to consider the temporary or permanent sterilisation of the patient by operative means.

PRACTICAL MEMORANDA.

THE USE OF WOUND CLIPS IN PERINEORRHAPHY.

By FREDERICK J. TAUSSIG, M. D., of St. Louis.

About two years ago a suggestion was made almost simultaneously by American and German gynecologists to use metal wound clips (Michel) for the closure of the skin in repair of the pelvic floor. I have since that time used them in about 20 cases, and have been very favorably impressed with the improved results thereby obtained.

In all operative work about the perineum there is special danger of infection because of the proximity of the anus. Wherever catgut is exposed to such infectious material, it presents a good culture medium for bacterial growth. For this reason many gynecologists have avoided its use in perineal work. The objection to silkworm gut is that it cuts through and thereby allows bacteria to enter the deeper tissues. Some operators have employed the subcuticular buried catgut suture for closing the skin. My personal experience with this suture is that it is not adaptable where the skin is so thin and loose as over the perineal body.



These facts induced me to try the metal clips. At first I employed them for the tissues about the vaginal fourchette as well as over the perineal body, but I found that about the fourchette they caused considerable pain and irritation, and pinched through quickly, thus making them difficult to remove. I therefore have of late limited their use to the skin of the perineum.

After the usual flapsplitting operation with exposure of the levator ani fibres on either side, I have been using the following suture material for the repair of the pelvic floor:—

1. No. 2 catgut, double, three or four interrupted sutures for the levator ani muscle.
2. No. 2 catgut, single, three or four interrupted sutures for the deep and superficial fascia.
3. No. 2 catgut, single, purse-string suture closing the vaginal end of the cut, and one interrupted suture approximating the skin of the fourchette.

4. Three or four Michel metal clips for closing the skin.

The clips effectively prevent the entrance of fecal material into the wound, and by merely pinching the superficial tissues do not allow infection of the deeper structures. It is important to remove the metal clips not later than the sixth or seventh day after operation, as they otherwise cut through and become difficult to unfasten.

My experience, in a few cases of recent perineal tears after childbirth, would lead me to condemn the use of metal clips in such cases. The tissues are at this time so edematous and soft that the clips cut through in a few days, become buried and are difficult to remove. Ordinarily there is no pain connected with removing skin-clips from the perineal skin.

SIMPLE METHOD OF PREPARING THE SKIN FOR SURGICAL OPERATIONS.

By E. H. BECKMAN, M. D., of Rochester, Minn.

A little over a year ago one of our staff, while visiting clinics in Italy, saw a method of preparing the skin for surgical operations in use in the clinic of Dr. Bastianelli in Rome, which we have used continuously since that time and have found simple, economical and effective. It is as follows:—

The method of preparation consists of applying two solutions to the dry skin. The first solution is composed of one part of iodine crystals to a thousand part of benzine. Solution No. 2, consists of three and one-half per cent. tincture of iodine made by diluting the ordinary tincture one-half with alcohol. If it is necessary to shave the field of operation before preparing the skin, this should be shaved either dry or by using benzine so that no water is absorbed by the cells of the tissues. Or, if desired, the field of operation may be shaved some hours before. Solution No. 1 is painted over the field of operation with a piece of gauze, simply rubbing enough to remove all dirt and scales from the skin. All the benzine should be allowed to evaporate, leaving the skin absolutely dry before solution No. 2 is applied. Solution No. 2 is then applied by painting over the field of operation with a pledget of cotton or a piece of gauze, saturated with the tincture of iodine. One coat of each solution is sufficient.

We have found this method of preparing the skin suitable for all classes of cases. The only type of case in which we do not use it is in exophthalmic goitre, where it is contraindicated on account of the iodine. It is simple, easy to apply, inexpensive, and, so far as antisepsis is concerned, as efficient as any method we have ever tried.

It is a particularly good method of preparation for emergency cases, especially cases of injury to the hands or arms in persons who have been working in grease. If it is desired, one can have in the emergency-room two vessels containing the above solutions. The injured part can be immersed in solution No. 1 and allowed to dry, and then immersed in solution No. 2, after which the patient is ready for operation.

After having used this method of preparation in all classes of cases for more than a year, we can recommend it. Care should be taken not to let the solutions run down into the creases in the groin, for when they dry slowly the skin is blistered. The tincture of iodine should not be too old, or it may become irritating.

FOR OBTAINING THE MAXIMUM EFFICIENCY FROM LIQUID GLASS DRESSINGS.

By HERMANN B. GESSNER, M. D., of New Orleans.

At one time plaster-of-Paris dressings were applied by wrapping layers of gauze around a part and then rubbing into the meshes a plaster cream. This was repeated until the desired thickness had been applied. The result was lack of uniformity and strength. To-day every one uses gauze bandages whose meshes have been previously filled with the plaster; proper soaking before use completes their preparation. Liquid glass, according to my observation, is to-day employed as plaster-of-Paris was twenty years ago: a dry gauze bandage is applied, then the glass is painted on with a brush, this process being repeated until enough of bandage and of glass appears to have been laid on. A better way is to thin the sodium silicate, as it comes from the dealer, with hot water to the point where it flows easily. The gauze bandages are then dipped in the diluted glass until every fibre is soaked with it; they may then be applied like the wet plaster bandages. When thus used liquid glass gives a firm support, which in equal thickness with plaster-of-Paris, almost if not quite equals it in strength, while having the advantage of greater lightness. Its only disadvantage is the prolonged period of drying and hardening—eighteen to twenty-four hours—which makes it unavailable for fresh fractures and other conditions that require a rapidly-hardening means of immobilization.

THE HUNT FOR THE AMEBA.

By S. STROUSE, M. D., of Chicago.

It is not uncommon for the diagnosis of amebic dysentery to be missed on account of failure to demonstrate motile amebæ in the stools. The secret of doing this lies in using fresh stools, keeping them warm, and examining them immediately,—remembering that not only the stools, but the slides and the microscope likewise must be kept warm. Possibly as simple and efficient technique as can be employed is the following. The microscope is put on a radiator, or if electric light is available, a bulb is placed under the stage of the scope. This light will serve as heater and illuminant. The microscope should be as near the patient as possible. A high rectal tube is passed, and the fecal matter, often containing blood or mucus, found in the eyelets of the tube is transferred to a warm slide, covered with a warm cover slip, and immediately studied. In case it is necessary to carry the tube to a laboratory, this is best done by arranging two pans like a chafing-dish, the lower one containing water at about 100° F., the upper one resting on the water, and containing the tube. Before the diagnosis of amebæ is justified, one must find unicellular organisms, showing actively motile pseudopodia, and moving from place to place by the activity of the pseudopodia.

DIAGNOSIS OF FETAL POSITION.

By H. EHRENFEST, M. D., of St. Louis.

The practice of basing the diagnosis of the fetal position upon the location of the centre of most distinct fetal heart-sounds is incorrect and

unreliable; nevertheless, it appears to be very prevalent. The position of the fetus should first be ascertained by careful palpation. A simple consideration then will determine where the fetal heart-sounds should be most distinctly audible. Auscultation of this area will at once prove or disprove the correctness of the palpatory diagnosis. As the result of finding heart-sounds in an unexpected position, this mode of procedure will convey to the examiner, in some instances, the first suspicion that a certain palpated head and back cannot belong to the same fetus. The proper course of examination—first palpation, then auscultation—is one of the most important and advantageous means of detecting an unsuspected twin pregnancy.

HOW TO MAKE LABORATORY MOSQUITOES BITE.

By CREIGHTON WELLMAN, M. D., of Oakland, Cal.

Those who conduct experiments with biting insects, under laboratory conditions, are sometimes greatly hindered and even frustrated in their investigations by the refusal of the mosquitoes, etc., in captivity to bite men and animals readily. Borrowing a leaf from the books of our grandfathers who encouraged leeches in the same way, I have found that often when mosquitoes are refractory, wetting the skin slightly with fresh milk will tempt them to bite.

REFERRED PAINS DUE TO PROSTATITIS.

By JOHN R. CAULK, M. D., of St. Louis.

Pains in the back and down the legs (lumbago and sciatica), and, occasionally, pains simulating renal colic associated with hematuria, are frequently due to prostatitis with periprostatic adhesions involving the pelvic nerves, and to a verumontanitis. Relief is often obtained by a systematic treatment of the prostate, breaking up the lateral adhesions, and by application to the verumontanum through the endoscope.

THE PREPARATION OF TISSUE FOR MICROSCOPICAL EXAMINATION.

By CARL FISCH, M. D., of St. Louis.

It is a well-known fact that material is often sent to the laboratory in such condition that it is impossible to study it with any degree of accuracy. When one remembers that tissues contain about 85 per cent. of water, it is easy to understand that a small amount of active preservative will necessarily be diluted; sometimes to the extent of 20 per cent. With alcohol this dilution acts not as a fixing but as a destroying medium of the structure. Only too often a large tumor is squeezed into a container that is no larger than the tumor itself; the narrow spaces between the tumor and the container being then filled with alcohol or other preservatives. The outcome of this procedure is that the inner portion of the tumor is not fit to study, on account of the inability of the small quantity of alcohol to counteract the quantity of water contained in the tumor. Similar results obtain with formol and Zenker's fluid.

The quantity of the preservatives selected should at least be ten times the volume of the tissue, since it is a fact that the larger the quantity of

the preservative the better are the results, as regards microscopical examination. Of course it must be understood that in those specimens in which the pathological changes are easily recognized, the necessity of the quantity of the preservative is not very important; but when the study of the cell structures is the object the importance of the quantity of the preservative cannot be questioned.

As to the best media which should be employed, opinions are not at one. Hansemann, for instance, objects to the use of formol, because it causes deposits of blood-pigment in the tissue. This, however, is not a well-founded objection as it requires considerable length of time for formol to cause these deposits. Tissues hardened in formol for two days, then washed in water and dehydrated by alcohol are free from these deposits. The formol material (2 days) can be secondarily dealt with by other fixatives, bringing about the same effect as is obtained by primarily using them for fixation of fresh tissue.

Now, despite any objection to formol as a fixing agent, it can be stated that it is the best medium which we have, provided it is used in a 10 per cent. solution. But for the differentiation of granules and the staining of the various forms of leucocytes, alcohol is the best medium that can be employed. The great advantage, however, which formol possesses over alcohol is that it perfectly preserves the red corpuscles, whereas alcohol changes them to mere shadows. Where the structure of a pathological formation is clearly outlined, a diagnosis may be arrived at during an operation by making frozen sections. Thin pieces are placed for two or three minutes into a 10 per cent. solution of formol and washed in water shortly afterwards.

The important point to remember, as regards the preparing of a specimen for microscopical examination, is the matter of using a large quantity of a preserving fluid. For references bearing on this point, I will call the reader's attention to two authorities in microscopic work—namely, D. V. Hanseman: "Some Remarks on Microscopic Technique" (*Berlin. klin. Wochenschr.*, No. 38, 1910), and C. Benda: "The Question of Surgical Material for Microscopic Diagnosis" (*Berlin. klin. Wochenschr.*, No. 50, 1910).

DRESSING OF THE DONOR'S SURFACE IN CASES OF SKIN-GRAFTING BY THE THIERSCH METHOD.

By HERMANN B. GESSNER, M. D., of New Orleans.

The raw surface left by the removal of strips of epidermis with a razor by the Thiersch method is usually dealt with by one of two methods: either the surface is liberally dusted with aristol or some other drying powder and then covered with absorbent gauze, or some non-adhering dressing like oiled-silk or gutta-percha tissue is laid on. Each of these methods is followed by some good and some indifferent or unsatisfactory results. A simple treatment of this surface and one that has afforded uniformly satisfactory results consists in applying sterile strips of ZO rubber adhesive plaster. This combines the non-adhering quality of oiled-silk and gutta-percha with the stimulating properties of the zinc oxide, which tends to promote epidermization. The strips must be long enough to project beyond the raw surface and adhere to the dry, unbroken epidermis bounding it. They may be changed readily at intervals of three or four days without injury to the developing epidermal cells.

CORRESPONDENCE

MEETING OF THE CANADIAN MEDICAL ASSOCIATION IN MONTREAL.

(From Our Special Correspondent.)

The forty-fourth Annual Meeting of the Canadian Medical Association opened in Montreal on Wednesday, June 7th, and continued up to Friday evening, June 9th. The attendance was large, many McGill University medical graduates having come for the opening of the new medical building of that University, which took place on the previous Monday. The program arranged for the meeting was excellent and was carried out in a satisfactory manner. The meetings were held in the new medical building of McGill University, which is peculiarly well adapted for such a purpose. The first general meeting was held in the anatomical laboratory, when the President-Elect, Dr. George E. Armstrong, was installed; addresses of welcome were given and reports and minutes were read. Dr. Armstrong soon after his installation was compelled to leave the room through illness. On Wednesday afternoon meetings of the various sections were held, but there will not be space to consider these in detail. Three symposiums took place in the section of medicine on acute poliomyelitis; in the section of obstetrics and gynecology on temperature in the puerperium; and in the section of preventive medicine on typhoid fever and water-supplies. At the latter some really very useful and instructive papers were read, and the discussion thereon brought out one or two points of exceptional interest. For example, Dr. Starkey, Professor of Hygiene at McGill University, has argued for some time that in most, if not in all, epidemics of typhoid, the typhoid-like infections, those which do not react to the Widal test, are largely in evidence, and that these should be watched carefully in order that the disease is not spread by their agency. This view of the situation was accepted by the majority of those present. A lucid description was given by Major Lorne Drum, of Ottawa, of the recent epidemic of typhoid fever there; and further proof was given, if such proof be needed, of how an epidemic may be spread by a contaminated water-supply.

On Thursday afternoon, June 8th, a general meeting was held at which the President's address, the address in Surgery, and an address on Cholelithiasis were given. Unfortunately the President was not well enough to attend the meeting, and in his absence his address was read by Dr. A. Hutchinson, of Montreal. Dr. Armstrong reviewed the history of the origin and development of the Canadian Medical Association, and paid tribute to the high standard of education and ethics of the medical profession in Canada. The Roddick Bill for Dominion Registration was then discussed, and the hope was expressed that with the adoption of the act the Councils of the English-speaking provinces would unite on a uniform standard of matriculation. The new President was especially emphatic with regard to the great value of medical research, and pointed out that it was on the basis of research for commercial purposes that the progress of Germany was built to-day.

Dr. A. Primrose, of Toronto, gave the address in Surgery, and said in part that Canada being a young country, something of the spirit of the pioneer settlers has been inherited, and Canadian medical men are more ready to develop along lines which may be new and revolutionary in character. The consequences of this willingness to learn have been that nowhere is work done in surgery with more uniform efficiency than can be found in the hospitals of Canada to-day. The greater part of Dr. Primrose's able address was taken up with a consideration of Lister and his work, and with a plea for a more open mind with respect to discoveries and new work in medical and surgical science. While acknowledging that conservatism in surgery is good, the speaker deprecated, as not infrequently happens, prejudice masking in the guise of conservatism.

The next paper was contributed by Dr. W. J. Mayo on a subject with which he and his brother are intimately versed, that of the surgical treatment of gall-stones. Dr. Mayo said in reviewing 4,000 operations performed by the brothers Mayo upon the gall-bladder and biliary passages, he had been impressed with the fact that the mortality was due to the complications incident to the disease, rather than to the removal of gall-stones from the otherwise normal gall-bladder. While complications were to be feared, the gall-stones themselves were responsible for them. It was in the early period that operation furnished an easy, safe, and efficient cure. Cholecystostomy with temporary drainage of the gall-bladder to the surface was the operation preferred, because it saved this valuable organ for future function. The danger of re-formation of gall-stones after cholecystostomy was exceedingly small. In the Mayo brothers' series they observed but three cases in which stones had re-formed in the gall-bladder, and it was probable that in the majority of supposed re-formation of gall-stones, the stones had not re-formed but were incompletely removed at the primary operation; an accident which does not often happen when the operation is done early.

In the 4,000 operations the average mortality was 2.75 per cent. In 2,920, the disease was local and confined to the gall-bladder and cystic duct. The operative mortality was 1.6 per cent. In 2,165 of these, cystectomy was performed, with a mortality of 1.5 per cent. In 755 cases, cystectomy was performed with a mortality of 2.4 per cent. In 492 cases in which the common duct was involved there was an average mortality of 8 per cent.; a mortality which depended not so much upon the operation itself as upon the extent of involvement of the liver and pancreas, and the bad general condition of the patient. Pancreatitis as a complication occurred 359 times in the 4,000 cases.

A particularly pleasing feature of the meeting was the presentation of a bound illuminated copy of the first issue of the Journal of the Association to Dr. MacPhail, its gifted editor, for his energy and zeal in assisting to establish the publication. Perhaps the event of the meeting most looked forward to was the delivery of the address in Medicine by Sir James Barr, of Liverpool, England. Sir James has made for himself a reputation not only for his medical knowledge, but for his ability as a racy, witty, or rather pawky and effective speaker. Sir James certainly did not belie his reputation, but spoke up to it with the utmost vim. The speech was a hard-hitting one, in which he tilted vigorously against many of the abuses of the day. The giving of the address was made the occasion of a social function. It was given in the gallery of the Art Association of Montreal, and was preceded by an instrumental concert and followed by a reception. There was a brilliant audience, including

a large number of ladies. The title of the address was "Preventive Medicine, the Medicine of the Future." Sir James Barr gave it as his opinion, that the hope of the human race lies in the physician, and that, as the majority of diseases are preventable if the public were alive to their own interests, they would pay medical men liberally for directing them in the paths of truth and in the ways of health rather than for treating their diseases. He further holds the view that so far as preventive medicine is concerned, very little can be placed to the surgeon's credit. About the only diseases which they attempt to prevent are those which spoil their operations—erysipelas, pyemia, and septicemia. On the question of heredity and disease his views are not quite in accord with those of the majority of the medical profession. Quoting from a speech made recently by Dr. Osler in Dublin, to the effect that it is a matter of common knowledge that consumption is not hereditary, Sir James retorts: "We know nothing of the kind, although we are having it constantly dinned into our ears by medical men who ought to know better." He is greatly concerned at the multiplication of degenerates in cities, and thinks that the manner in which useless lives are saved nowadays is bad for the future of the race. He points out that those countries, which have to a large extent suspended a selective death-rate, but have not been wise enough to establish a selective birth-rate, are certain to decay. Sir James seems somewhat a believer in the principle of the survival of the fittest. At any rate, he strongly holds that propagation of the unfit should be controlled, and especially of the insane and mentally deficient. In conclusion he said that he was not now so much concerned with the prolongation of life as with the preservation of health. Medical men were not concerned with any useless attainment of longevity, but with the prolongation, together with the efficiency of life. When a life ceased to be efficient, it should retire into obscurity, be withdrawn from circulation, or receive an old age pension.

June 15th.

PARIS LETTER.

ORGANOTHERAPY IN CARDIAC COMPLICATIONS OF INFECTIOUS DISEASES.

By AUGUSTE A. HOUSQUAINS, M. D.

The French authors who have done epochal work in connection with the cardiopathies are Sénac, who in 1749 published a very remarkable treatise for that epoch on diseases of the heart, Corvisart, Bouillaud, Duroziez, Merklen, Huchard and Potain. Without belittling the importance of the work of Corrigan, Stokes, Traube, it can be said in all justice that diseases of the heart have engaged the attention of French physicians uninterruptedly, and the result has been a large number of articles. The clinical features, the anatomo-pathology, and finally the study of the pulse by the graphic method (Marey and François-Franck) have in turn occupied the thought of the French investigators. But better than all this, the recent investigations have established new methods of

diagnosis in cardiac diseases: the phlebograph, which has been perfected, the esophagocardiograph and electrocardiograph.

The far-reaching discovery of His's bundle has resulted in the further study of arrhythmias. Physiology, anatomy, and the anatomico-clinical method have been instrumental in establishing the primordial rôle played by this fasciculus of fibres in the production of the cardiac rhythm and the fact that its lesions engender divers arrhythmias. It cannot be denied that it would be an exaggeration to say that all arrhythmias are due to alterations in His's bundle; but without doubt the part which the nervous system plays in these disturbances should not be overlooked when studying the pathogenesis of a certain number of them. By assuming this to be a fact, new horizons in regard to cardiac pathology have been opened up and much can be expected in the future from further studies.

But within the limitations of this letter it would be foolhardy to attempt a complete description of this vast subject by mentioning all the recent acquisitions in the matter of diseases of the heart. I shall limit myself to the examination of one important phase, based on the study of the functions of the ductless glands and which has thrown considerable light on the nature of the cardio-vascular complications which are seen in the course of, or following infectious diseases.

The cardiac forms of infectious diseases, such as typhoid fever, scarlatina, or diphtheria, are, as one knows, characterized by a cardio-vascular syndrome, the prognosis of which is generally grave since death often supervenes, whether from syncope or from collapse.

What is the pathogenesis of these unfortunate accidents? It has been proposed to explain them on account of the presence of a myocarditis. This explanation, plausible in certain cases, is not satisfactory in all, and it is necessary, as we shall later on see, to study certain functions of the vascular glands so as to enlighten us as to the real cause of the larger number of these accidents.

It is hardly necessary to recall the clinical picture of these cardio-vascular disturbances. At any time during the disease, but principally at the end of the acute attack, one may observe the patient confined to his bed, prostrated, without any strength, the skin pale and cold, and covered with perspiration, the extremities more or less cyanosed.

The pulse is rapid, irregular at times, filiform, arrhythmical. On auscultation the heart-sounds are muffled, sometimes there is a bruit. On palpating the precordial region the apex cannot be made out, but at most a sort of vague undulation. The arterial tension is very much lowered, and the tendency to syncope is extreme; the patient suffers from nausea, and from diarrhea. Sudden death may supervene from the slightest change in position. These complications have not always the same intensity nor are they of the same frequency in the infections.

If one remembers that the therapy follows logically the pathogenic idea of these diseases, one readily understands why researches have been made as to the causes of the cardio-vascular disturbances which are seen in the course of infectious diseases. Since the time when Louis gave us his idea of myocarditis, this lesion has been the object of the closest study, but though we are convinced that if toxo-infectious myocarditis explains a number of the cardiac accidents observed in the course of diseases such as typhoid fever, scarlatina, diphtheria, it nevertheless does not explain the cases in which, in spite of the undeniable cardio-vascular disturbances, the autopsy shows a heart apparently normal. Latterly, investigators have attributed the cause of these cardiac disturbances to

the central nervous system, the nerves and the ganglions of the heart. But isolated facts are insufficient to support this theory, since in all cases the interpretation is purely speculative and therapeutic application is without any results. However, this does not obtain as regards the most recent causative factor—namely, alterations in the suprarenal capsules. The new conception attributes the cardiac complications in infectious diseases to insufficient function of these capsules.

On what basis does this theory repose? We know for certain, and the researches of Loeper and Oppenheim have demonstrated this experimentally with animals, that all the infections, no matter of what nature, show on the surface of the suprarenal capsules alterations more or less profound according as the infection is more or less intense. Autopsies have demonstrated that the same obtains in man. The important question in this matter is to ascertain whether all, who die from infectious diseases complicated by cardiac disturbances, show post-mortem alterations in the suprarenal capsules. A case published by Sergeant, in which he describes the syndrome of an acute suprarenal insufficiency, is most characteristic. Sergeant found, at the autopsy of a patient who had had pneumonia and died on the fourth day, the suprarenal capsules profoundly altered, congested and hemorrhagic. It is necessary to mention here the case published three years ago by Hutinel, of a young girl at whose autopsy there was revealed an acute inflammatory state of the suprarenal capsules; the patient having died as the result of convulsions with cyanosis and extreme depression in the course of bronchopneumonia.

Is it not striking to what extent the cardiac symptoms in infections resemble the syndrome of suprarenal insufficiency? We note in the latter, in divers degrees, the salient features described by Sergeant and Bernard; that is to say, lumbar and abdominal pains, anorexia, vomiting, diarrhea, weakness, prostration with hyperthermia, thread-like pulse, and the tendency to collapse. As to the frequency of death, we know to-day how often it occurs in suprarenal insufficiency. According to Hutinel there is a brown discoloration of the skin; but so rapid is the evolution of the various phenomena that this symptom has not time to develop in the majority of cases.

The arguments in favor of therapeutics based on the same ideas are not less convincing. We are aware of the gravity of the prognosis in infectious maladies with cardiac complications, and of the unexpected results suprarenal therapy has yielded in certain cases. Martin and Darré, Méry, Weil, Hallé have cited instances in which intense cardio-arterial complications have disappeared rapidly under the influence of suprarenal organotherapy. The employment of adrenalin has, in analogous cases, been attended by a remarkable therapeutic success in the hands of Netter, Josué, Moizard and Courby. All these authorities are in accord as to the rapidity of the amelioration affected by suprarenal organotherapy, whereas the same agreement does not obtain with other preparations. According to Renon and Armand Delille, the pituitary body plays an equally important rôle in the production of the toxi-infectious cardiac syndrome; which is not at all improbable, since we know the action of the hypophysis cerebri in regulating the arterial tension.

Hence, though we cannot furnish proof direct of what has been just stated, we nevertheless have in our possession a large number of presumptions of weight, which indicate that the suprarenal capsule is no negligible factor in the causation of those cardio-arterial complications which may be observed in the course of infectious diseases. In all cases

the value of the suprarenal capsule as a therapeutic agent is such that its use is indicated in the treatment of these grave disturbances.

Organotherapy should not be substituted for all the classical methods usually employed in the treatment of the cardio-pulmonary complications in infectious diseases, but it should occupy an important place in the therapy to which the practitioners of to-day resort. It is well in its way to order complete quiet for a patient; the ingestion of small quantities of milk; cardiac medicines and stimulants for the nervous system; but though all this is closely followed we should not fail to employ organotherapy directly cardiac complications set in.

Either adrenalin or the extract of the entire gland may be used. At the present time, preference is given to the latter. The total suprarenal extract is less dangerous and does not provoke, as Loeper has demonstrated as regards adrenalin, atheromatous lesions of the aorta; again it is easy to handle; and finally its action is more complete than adrenalin which contains only the active principle of the gland. On the other hand, in urgent cases with imminent syncope, when we require an immediate effect, we can have recourse to the intravenous and subcutaneous injections of adrenalin. Is it necessary to employ hypophysial organotherapy in conjunction with suprarenal organotherapy? This question has not as yet been satisfactorily answered, but it would seem that in certain cases this association is useful.

Suprarenal organotherapy in cardiac complications of infectious diseases is no longer a theory but a fact of undoubted value; not only has it diminished the gravity of the prognosis, but it holds out a hope which other modes of treatment do not.

June 10th.

DIAGNOSTIC AND THERAPEUTIC NOTES.

A NEW METHOD OF DETERMINING THE FREE HYDROCHLORIC ACID IN STOMACH CONTENTS.—Holmgren (*Deutsch. med. Wochenschr.*, No. 6, 1911). Holmgren has devised an extremely ingenious and simple method for determining the percentage of free hydrochloric acid in the stomach contents. It is based upon the observation, that when a little dilute acid is dropped upon filter-paper, the water penetrates farther into the meshes of the paper than the acid. A round wet area results, the central portion of which is acid, while the periphery, which consists merely of water, is neutral in reaction. The less the degree of acidity of the solution, the smaller will be the central portion of the wet spot that has an acid reaction as compared with the total diameter of the moist area. The apparatus consists of a rubber stamp which prints a series of dots one millimeter apart, a one per cent. solution of congo red and a block of filter-paper. The stamp is moistened with the congo red solution and pressed upon a sheet of filter-paper, printing upon it a line of red spots one millimeter apart. A few drops of the stomach contents are then placed on one of these spots and the paper laid aside until the fluid has ceased to spread. If the stomach contents contains free hydrochloric acid, a certain number of the red spots will have been turned blue, whereas others nearer the edge of the moist area will be wet, but will have retained their original red color. A comparison of the number of blue spots with the total number of wet spots enables one to estimate, by means of special table, the percentage of free hydrochloric acid. The advantages of the method, besides its simplicity, reside in the small amount of stomach contents required and its applicability at the bedside.

THE THERAPY OF ACIDOSIS.—Lichtwitz (*Therap. Monatsh.*, 1911, No. 2). Sodium citrate, which Boas considers the best antacid in hyperacidity, is recommended by Lichtwitz in the acidosis of diabetes mellitus. It is oxidized in the organism to sodium bicarbonate, and thus has the same power of combating acidosis as the latter, to which however it is superior in that it is more easily borne in large quantities by the stomach, and in that its smaller degree of alkalinity more readily permits of its use hypodermically.

A NEW SIGN IN HEMOPHILIA.—Frugoni and Giugni (*Sem. Méd.*, 1911, No. 3). If the arm or leg of a patient with hemophilia be constricted, as is done for instance in the determination of the blood-pressure, by means of a Riva-Rocci arm-band, subcutaneous hemorrhages will occur in the congested area. The intensity of this phenomenon varies with the

severity of the affection, but will be found present even when the hemophilia is not manifesting itself otherwise. Diseases, accompanied by a temporary hemophilia, show this tendency to the production of petechiæ only so long as the tendency to bleeding persists.

HORMONAL IN CHRONIC CONSTIPATION AND PARALYTIC ILEUS.—Krauert (*Muench. Med. Wochenschr.*, 1911, No. 17). Hormonal is the trade name of the peristalsis hormone discovered by Zuelzter. It is a chemical substance which occurs in all the organs of the body, but especially in the spleen, and which exercises a specific stimulus upon the peristalsis of the intestine. It is administered by deep injection into the gluteal muscles in an average dose of 15 c.c. Zuelzter, Henle, and Saar have reported observations with this drug, that are almost incredible: a single injection being followed by permanent cure of obstinate chronic constipation. Some of these observations have been chronicled in these columns. Krauert's results are equally striking. In 5 out of 9 cases of chronic constipation, a positive result was observed. On 2 of these the effect was apparently permanent, the chronic constipation disappearing completely, so that the patients felt as if "born anew." In the other 3 cases a temporary effect only was obtained, but in them the constipation was produced by an organic lesion.

The most striking results were obtained in 7 cases of post-operative paralytic ileus, which had resisted the ordinary methods of treatment. In all of them a prompt cure followed a single intravenous injection of hormonal. It is in this group of cases that the true field of usefulness of hormonal will probably be found.

A NEW METHOD OF PERCUSSION.—Wenzel (*Zentralblatt fuer innere Medizin*, 1911, No. 10). The percussion of the pulmonary apices can be rendered more delicate by anything that tends to render the lung resonance duller. Slight differences in the resonance on percussion of the supra- and infraclavicular fossæ become more marked if the patient stands with his bare back pressed firmly but not uncomfortably against a wall. Wenzel has found this method, which he calls "wall percussion" (*Wand-perkussion*) useful in the early diagnosis of tuberculosis.

THE DIAGNOSIS OF BEGINNING AORTIC SCLEROSIS.—Kukowerow (*Russky Wratch*, 1910, No. 51; abstr. in *Muench. Med. Wochenschr.*, 1911, No. 17). Several years ago Ssirotin observed that in many people, if they stand erect with both arms raised, a systolic murmur is audible in the right second intercostal space; whereas, if the arms are allowed to drop only the normal cardiac sounds can be heard. This murmur, which usually has a blowing or scraping character, usually replaces the first sound immediately after raising the arms; sometimes, however, only after an interval of several seconds. Further investigation has shown that this murmur arises in the aorta and indicates a sclerosis of the por-

tion of the aorta nearest the heart. It is found chiefly in elderly individuals who complain of anginal pains. Kukowerow examined 2,173 patients with special reference to this sign and found it present in 164. It occurs chiefly in individuals in whom there is reason to suspect beginning arteriosclerosis, especially in those who eat excessively of meat, who smoke too much, and who are subjected to great nervous strain. Its diagnostic significance is the same as that of the ordinary systolic murmur characteristic of aortic sclerosis; in many cases, however, the murmur described above occurs earlier and characterizes an earlier stage of the disease. It has also a prognostic value in that its disappearance, as a result of treatment, must be interpreted as a favorable sign.

BOOK REVIEWS.

FOOD AND FEEDING IN HEALTH AND DISEASE. A manual of Practical Dietetics. By Chalmers Watson, M. D., F. R. C. P. E. Assistant Physician, Royal Infirmary, Edinburgh, Editor of the "Encyclopedia Medica." London: Oliver and Boyd. 1910. Price, 10/6.

The book has been written with the needs of the practising physician constantly in view. A few brief chapters, in the beginning, are devoted to some elementary consideration in the physiology of digestion, and the following chapters to a discussion of the various food-stuffs, chemical compositions, digestibility and, especially, the various forms in which each food may enter into the dietary, with directions for preparing the various dishes. The reviewer believes that the incorporation, as it were, of a cook-book with a book on dietetics is a most excellent plan. The physician so often hears from his patient, "I can't take eggs," or some other food; whereupon the physician drops that article from the prescribed list. In the great majority of cases the real truth of the patient's statement amounts to this: he cannot take this or that food in the form in which it has been customarily prepared for him. If the doctor were sufficiently acquainted with the technique of the kitchen, he would very rarely, indeed, be obliged to strike from his prescribed dietary a food which he believes necessary. It is therefore very gratifying to see in a book of this kind not only the general and theoretic considerations in the preparation of the various foods, but along with these a large number of well-selected recipes in cook-book form.

The author takes a rather one-sided stand on the question of alcohol. However, it must be remembered that he has seen this article abused more frequently than his American confrères. A large part of this book is devoted to a consideration of the dietary in various diseased conditions—typhoid fever, gastric ulcer, obesity, neurasthenia, etc. Here again there is a satisfying combination of theoretic considerations with definite working plans. For example, the Weir Mitchell treatment in neurasthenia is described in detail week by week, with directions as to massage, rest in bed with the amount and kind of food, and frequency of feeding set forth in a Daily Diet Sheet. The last fifty pages of the book, containing a number of the author's published observations on the effects of certain foods in animal feeding, might well have been omitted from a work of this kind. On the whole, the book is a most excellent work for the practitioner on a subject which has been and is most woefully neglected.

MENTAL SYMPTOMS OF BRAIN DISEASE. An aid to the Surgical Treatment of Insanity, Due to Injury, Hemorrhage, Tumours, and other Circumscribed Lesions of the Brain. By Bernard Hollander, M. D., With Preface by Dr. Jul. Morel, Late Belgian State Commissioner in Lunacy. New York: Rebman Company. Price, Cloth, \$2.00.

Hollander has collected in his book on "Mental Symptoms of Brain Disease" practically all the cases in the literature in which symptoms of insanity have formed or been complications of brain injury, such as hemorrhages, tumors and other circumscribed lesions of the brain.

The remedy suggested, naturally, for most of these cases is surgical treatment, and in a sense this book of Hollander's might be regarded as an effort to give to surgery its proper place in the treatment of acquired insanity.

The book is divided into a number of chapters, devoted to the lesions in the various lobes of the brain; each of these divisions is illustrated by references from the literature. Naturally, no serious criticisms may be made of a book of this kind; the only thing that can be asked is that the references from the literature should be done with accuracy.

As a compilation of facts, dealing with its subject, Hollander's work should be regarded as praiseworthy. As a contribution to the actual subject of mental

symptoms of brain disease, Hollander's book can find no place, for the reason that his literature references bear date, some of them twenty-five or thirty years old. Naturally, clinical observations made so long ago as that are open to serious criticism.

Morel, in his preface to this book, calls Hollander a scientific explorer, and we may add that as an explorer of the past Hollander may be given a place. Great credit must be given him for his industry, and particularly for the modest way in which his conclusions are stated.

The book is recommended as an interesting, and, perhaps, valuable collection of past histories.

INEBRIETY—A Clinical Treatise on the Etiology, Symptomatology, Neurosis, Psychosis and Treatment and the Medico-Legal Relations. By T. D. Crothers, M. D., Superintendent Walnut Lodge Hospital, Hartford, Conn. Cincinnati: Harvey Publishing Company. 1911.

This book, written by one whose chief prejudices are concerned with alcoholism, is full of facts and conclusions which are tintured by onesided thinking. As a work of special pleading, it stands, perhaps, among the first on this subject.

The reader is forewarned that no scientific or objective study of the influence that alcohol exerts on the human organism is here to be found. With this position admitted, the contents of Crother's book may be of considerable value.

As an effort to consider carefully the question of alcohol from the point of view of medical science, the book finds no serious place.

A word might be said in regard to the style or, rather, the lack of it, in which this book is written. There is a certain curious, emotional tinge to many of the paragraphs incident to a discussion of the aspects of the question, which should have no place in a study of this kind.

In general, it might be said, that there is contained in this book a great deal of material that would be valuable if it were placed before the reader in a form more in line with the right kind of medical thinking. The author's wide experience might have furnished facts of unusual clinical interest, which would have enriched the subject if he had been inspired less by the fact that he is a kind of medical missionary on the question of alcohol than the author of a work, which aims to consider in a serious way the influence of alcohol upon the human organism.

As it is, Crother's book remains an exaggerated plea of one who is considerably overpowered by his subject.

OUTLINES OF PSYCHIATRY. By William A. White, M. D., Superintendent Government Hospital for the Insane, Washington, D. C., Third Edition, New York, The Journal of Nervous and Mental Disease Publishing Company, 1911, Nervous and Mental Disease Monograph, Series No. 1.

The fact that White's "Outlines of Psychiatry" should have reached the third edition is sufficient evidence that it has met a demand among students and practitioners. The third edition has, for the most part, been changed only by elaborating some of the chapters; no fundamental differences are to be noted from the earlier editions.

As a textbook for students, White's "Psychiatry" can be recommended with considerable enthusiasm. It is well and clearly written, and avoids for the most part the moot points in psychiatry which are apt to be stumbling blocks to the immature student. While the description of the disease-types is good, as has been said, and clearly state the necessary information, it is questionable whether the student, or even the general practitioner of medicine, can derive a clear picture from the text; and the reason is that no attempt is made to describe clinically, by actual case-histories, types of disease.

A word of objection to the long introduction might be here submitted. Of 265 pages, 112 are devoted to Methods of Examination, Symptomatology, Treatment, Classification, etc. Certainly, this seems a curious overbalance for a book destined for the general reader.

Notwithstanding these criticisms, White's "Psychiatry" remains to-day probably the best short treatise in English on the subject, and, as a representative in English of the Kraepelin school, it deserves the high regard in which it is held by the general medical reader.

HANDBOOK OF DISEASES OF THE EYE. A Textbook for Students and Practitioners. By Harry Caldwell Parker, M. D., Clinical Professor of Ophthalmology, Indiana University School of Medicine, Indianapolis, Ind. Illustrated with 115 text engravings, a half-tone frontispiece and five full-page chromo-lithographic plates, with 26 figures. Philadelphia: F. A. Davis Co. 1910. Price, \$2.00.

An addition to the already large number of manuals on ophthalmology should justify its existence by originality and authoritative utterance upon the most important parts of ophthalmic practice. Accepting such manuals as May's or Veasey's as standard, the present booklet suffers by comparison. The division by chapters is that usually adopted. In addition certain topics are introduced which are not ordinarily found in the manuals, as for instance, the tests for tuberculosis, and the relation of the eye to the nose. The book is written with a certain irritating cock-sureness and in a style that is frequently loose, and in places decidedly ungrammatical. In the chapter on refraction, the author outlines an excellent method with astigmatic charts which he describes as his own invention, but which are, in fact, only slight modifications of the well-known and deservedly popular charts of Verhoeff. The modification of chart 2 was actually suggested by the reviewer in a paper written in 1907.

FOOD AND THE PRINCIPLES OF DIETETICS.—By Robert Hutchinson, M. D., Edin., F. R. C. P., Physician to the London Hospital; Physician in Charge of Out-Patients to the Hospital for Sick Children, Great Ormond Street; Author of "Lecturers on Diseases of Children," "Patent Foods and Patent Medicines," "Applied Physiology," Joint-Author of "Clinical Methods." With plates and diagrams. Third Edition. New York: William Wood & Co. 1911. Price, \$3.00.

This work is more of a consideration of food than of dietetics; hence it is a less satisfactory rejoinder to the "almost total neglect of the subject of dietetics" than would be some other work which keeps constantly in mind the immediate needs of the practitioner. For one, however, who wishes full and complete discussions of the various food-stuffs, their chemical composition, calorific value, digestibility, assimilability, etc., this work offers abundant information. Much space has been devoted to patent and proprietary foods; too much, the reviewer thinks, in view of the perplexing rapidity with which they multiply and the distinctly commercial manner in which many of them are exploited. An excellent chapter on the cooking of foods is deserving of special mention.

GOLDEN RULES OF REFRACTION. By Ernest E. Maddox, M. D., F. R. C. S. Ed., Oph. Surg. Royal Victoria Hospital, Bournemouth; Late Assistant Ophth. Surg. Royal Infirmary, Edinburgh; and Syme Surgery Fellow, Edinburgh University. "Golden Rules" Series, No. XII. Third edition. Revised. Bristol: John Wright & Sons, Ltd. Price, 1 s.

It is really extraordinary how much trustworthy information of a practical nature has been included within the confines of this little vest-pocket book of ninety-six pages. Dr. Maddox has picked out the salient points of the art of refraction and set them down clearly and tersely. The booklet will be found highly useful to the beginner in refraction and suggestive to the more advanced student.

GOLDEN RULES OF OPHTHALMIC PRACTICE. By Gustavus Hartridge, F. R. C. S., Senior Surgeon Royal Westminster Ophth. Hosp.; Ophthalmic Surgeon and Lecturer on Ophthalmology, Westminster Hospital. "Golden Rules" Series, No. VII. Fifth Edition. Bristol: John Wright & Sons, Ltd. Price 1 s.

This tiny book of seventy-two pages contains a great number of practical hints to the beginner in ophthalmic practice. Its teaching is sound and in accord with modern ophthalmic concepts.

BOOKS RECEIVED.

PHILOSOPHIES. By Ronald Ross, F. R. C. S., D.Sc., LL.D., F. R. S., C. B. London: John Murray. Price, 1 s.

EDUCATION AND PREVENTIVE MEDICINE. By Norman Edward Ditman, Ph.D., M. D. New York: The Columbia University Press. 1911. Price, 25c.

VICIOUS CIRCLES IN DISEASE. By Jamieson B. Hurry, M. A., M. D. (Cantab.), Ex-President, Reading Pathological Society. With illustrations. London: J. & A. Churchill. 1911. Price, 6 s.

THE HOUSE FLY—DISEASE CARRIER. An Account of Its Dangerous Activities and of the Means of Destroying It. By L. O. Howard, Ph.D. New York: Frederick A. Stokes Co. Price, \$1.60.

"606" IN THEORY AND PRACTICE. By Geheimrat Professor Dr. Paul Ehrlich and J. E. R. McDonagh, F. R. C. S., Surgeon to Out-Patients, London Lock Hospitals. New York: Oxford University Press. 1911.

PRECIS D'ELECTROTHERAPIE ET DE RADIOTHERAPIE OCULAIRES. Par le Dr. A. Leprince (De Bourges). Avec 33 figures dans le texte. Paris: Librairie Médicale et Scientifique, Jules Rousset. 1911. Price, fr. 3.50.

GRUNDLAGEN UND ERFOLGE DER CHEMOTHERAPIE. Von Professor Dr. Paul Ehrlich, Geh. Obermedizinalrat, Direktor des Kgl. Instituts fuer Experimentelle Therapie in Frankfurt a. M. Mit 13 Tafelabbildungen. Stuttgart: Ferdinand Enke. 1911.

HAY FEVER AND PAROXYSMAL SNEEZING. (Vasomotor Rhinitis.) By Eugene S. Yonge, M. D. (Edin.), Physician to the Manchester Hospital for Consumptives and Diseases of the Throat. With two coloured plates. Edinburgh and London: William Green and Sons. 1910.

MANUEL PRATIQUE DE LA LITHOTRIE. Par F. Cathelin, Chirurgien en Chef de L'Hopital D'Urologie, Ancien Chef de Clinique et Lauréat de la Faculté de Médecine de Paris. Service du Professor Guyon. Avec 145 figures dans le texte. Paris: Vigot Frères. 1911. Price, 4 fr.

JOINT TUBERCULOSIS. By Leonard W. Ely, M. D., Consulting Orthopaedist to the County Hospital; Attending Orthopaedist to the Children's Hospital, Denver, Colo.; Member of the American Orthopaedic Association, etc. Illustrated. New York: William Wood & Co. 1911. Price, \$2.50.

GOLDEN RULES OF OPHTHALMIC PRACTICE. By Gustavus Hartridge, F. R. C. S., Senior Surgeon Royal Westminster Ophth. Hosp.; Ophthalmic Surgeon and Lecturer on Ophthalmology, Westminster Hospital. "Golden Rules" Series, No. VIII. Fifth Edition. Bristol: John Wright & Sons, Ltd. Price, 1 s.

DISLOCATIONS AND JOINT FRACTURES. By Frederick J. Cotton, A. M., M. D., First Assistant Surgeon to the Boston City Hospital; Assistant Professor of Clinical Surgery in Tufts College Medical School, Boston. With 1201 illustrations. 830 drawings by the author. Philadelphia: W. B. Saunders Co. 1910. Price, \$7.50.

MENTAL MECHANISMS. By William A. White, M. D., Author of "Outlines of Psychiatry"; Superintendent Government Hospital for the Insane, Washington, D. C.; Professor of Nervous and Mental Diseases, Georgetown University, Washington, D. C., etc. New York: The Journal of Nervous and Mental Disease Publishing Co. 1911.